No. 3. — *Mammal and Bird Collections of the Asiatic Primate Expedition*

INTRODUCTION

By Harold J. Coolidge, Jr.

The Asiatic Primate Expedition was organized by H. Coolidge. Its personnel included Dr. Adolph H. Schultz, Associate Professor of Physical Anthropology at the Johns Hopkins School of Medicine and a research associate of the Carnegie Institution; Dr. C. R. Carpenter, lecturer in Psychology at Bard College and research associate of the Peabody Museum at Harvard; Sherwood L. Washburn, Harvard graduate student and Sheldon Travelling Fellow; John A. Griswold, Jr., research associate in the Museum of Comparative Zoölogy; H. G. Deignan, an ornithologist who collected with the expedition in Borneo; John T. Coolidge, Jr., and Andrew Wylie, volunteer assistants.

Financial contributions from thirty different sources have been acknowledged elsewhere. These included the Milton and Sheldon Funds at Harvard. Johns Hopkins Medical School and Bard College, Columbia University, have our gratitude for granting leaves of absence with salary to valued members of their faculties for participation in this cooperative undertaking.

It was in a large measure the interest of the beloved late Professor William Morton Wheeler, as well as Dr. Thomas Barbour, Dr. George B. Wislocki, Dr. Ernest A. Hooton, Mr. Donald Scott, Mr. Edward Mallinckrodt, Jr., Mrs. Amory A. Lawrence, and Mrs. James A. Sullivan that made the Expedition possible.

Generous cooperation was extended to us by the Royal Siamese Government, the British North Borneo Company and their officials, the government of French Indo-China, the military and civil officials of the Netherlands Indies Government in Sumatra, Mr. J. Holbrook Chapman, our chargé d'affaires in Bangkok, and other American foreign service officials in Bangkok, Singapore, Saigon, Batavia, Penang, and Medan. We owe special gratitude to the Presbyterian Mission in Chiengmai, particularly to Reverend William Harris, Principal of Prince Royal's College, Dr. Edwin C. Cort, Superintendent of the McCormick Hospital, Miss Bates of the Jesseiton Hospital, Dr. V. A. Stookes of Sandakan, the Deli Maatschappij of Sumatra; and thanks to Mr. F. N. Chasen of the Raffles Museum, Mr. E. Banks of the Sarawak Museum, Dr. W. C. Osman Hill of Colombo, Dr. E. C. Dammerman of Buitenzorg, Dr. and Mrs. George Pinkley of the

American Museum, Baron Rodolphe M. de Schauensee of the Academy of Natural Sciences of Philadelphia, Dr. James Andrews of the Peabody Museum at Harvard, Mrs. and the late Mr. Martin Johnson, Mr. and Mrs. Harry Keith of Sandakan, Mr. Richard Evans and Mr. George Moffat of Jesselton, Dr. Lindsay Ride of the University of Hongkong, Mr. Peter W. Jansen, Mr. Herbert Cremer, Mr. P. G. Van Tienhoven, all of Amsterdam; Baron and Baroness Von Styrum of Medan, Mr. Monet B. Davis, our former Consul General in Singapore, Mr. Quincy Roberts, our former Consul in Saigon.

Contributions of equipment were gratefully received from the Remington Arms Company, the Burgess Battery Company, the Bell Telephone Laboratories, the Kohler Manufacturing Company, S. S. Pierce Company, the Borden Company, Dewey and Almy Chemical Company, J. H. Emerson of Cambridge, Dr. Robert K. Enders of Swarthmore, the Harvard Film Service, the Harvard Travellers Club and Dr. George C. Shattuck of the Harvard Medical School.

The Expedition operated in Siam,[1] French Indo-China, British North Borneo, and Sumatra from January to September, 1937. There were three main objectives for the field work. The first was to make collections of skins, skeletons, parasites and selected anatomical material, including embryos, of important primate types, especially the gibbon and the orang-utan. Five hundred specimens were collected. The primate collections were documented by detailed field measurements especially for comparative growth studies. Reports on various phases of the physical studies on primates are now in preparation by Schultz, Wislocki, Washburn, and Coolidge. Some preliminary reports have already been published.

The second objective was to make the first behavior study of wild gibbons in their undisturbed natural environment as well as a survey of the possibility of making a similar study of the orang-utan in Sumatra at some future time. Dr. C. R. Carpenter procured films and recordings as well as extensive notes, from which he is preparing a report on his gibbon behavior studies, and a brief report on the orang-utan in North Sumatra has already been published.

The third objective was to make general zoological collections for the Museum of Comparative Zoölogy from varying altitude zones in Northern Siam and British North Borneo. These totalled thirty-five hundred birds and mammals. A small collection, principally of large mammals, was also procured in French Indo-China. The pur-

[1]Now officially known as Thailand.

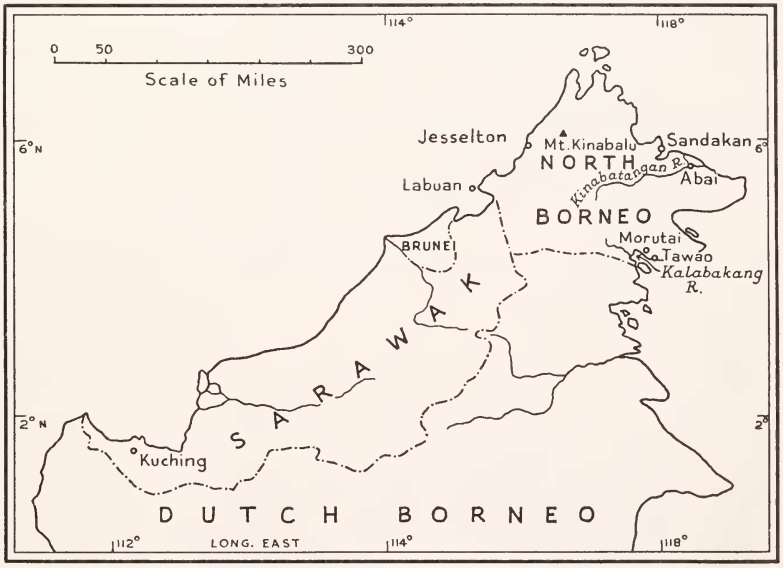
pose of this paper is to list with notes the more important birds and mammals procured in Siam, Indo-China, and North Borneo.

Mr. J. A. Griswold, Jr., was personally responsible for the making of a large part of the Kinabalu collection, and we are indebted to Mr. Wylie for a small collection of Indo-Chinese mammals.

The chief collecting in Siam was done in the Chiengmai region 350 miles north of Bangkok. The base camp for mountain collecting was at an altitude of 4300 ft. on Doi Intanon or Mt. Angka with additional collecting camps at about 5500, 6000 and 8075 ft. This third camp was at the summit of the highest mountain in Siam. There was another base camp at Chieng Dao at the foot of Mt. (Doi) Dao.

In Indo-China, Wylie did his collecting in the open forest of Southern Annam about 40 miles from Ban Me Thouet.

In North Borneo some collecting was done from Jesselton on the west coast, close to sea level. From this point Griswold made his

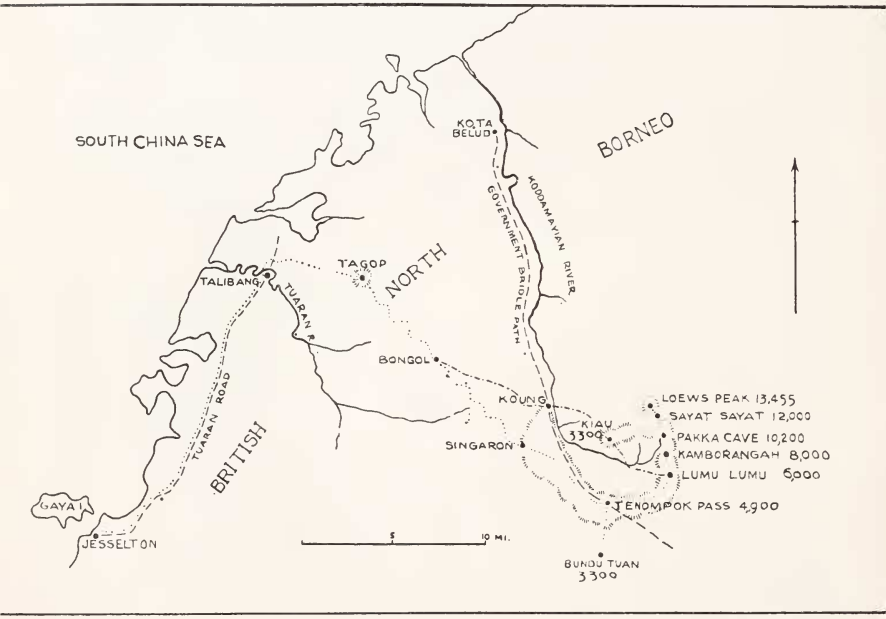


Sketch map of Northern Borneo to show collecting localities of the Asiatic Primate Expedition (1937).

ascent of Mount Kinabalu, the highest mountain in Malaysia. He collected for three months at varying altitudes, his principal base camp being at Lumu Lumu in the primary forest at 5500 ft. He also

had collecting camps at Bundutuan about 3300 ft., Pakka Cave about 10,000 ft., Sayat Sayat at 12,000 ft., and reached the summit of Lowe's Peak 13,455 ft.

On the east coast of North Borneo the primate study camp was at Abai near the mouth of the great Kinabatangan River, six hours by launch and 50 miles from Sandakan. H. G. Deignan collected lowland birds for us in the forest close to Sandakan, also at Merotai Besar, and at the mouth of the Kalabakang River on the east coast, not far from Tawao.



Detail map of Mount Kinabalu modified from F.M.S. Survey No. 149–1932, to show routes taken by J. A. Griswold and his collecting localities. Asiatic Primate Expedition, 1937.

..... Ingoing route
-.-.-.-.-.-.-.-.-.-.-. Outgoing route.

From late February until the rains start in May is the hot season in the Chiengmai section of North Siam. The country is as dry as a bone, the air hazy with smoke from forest fires, that leave behind them vast areas of charred leaves and stumps of tree trunks. At night

one can often see on the mountain slopes the twinkling of numerous forest fires which make a pink reflection on their own smoke. The temperature reaches 110° F. in April, and the nights seem almost airless, unless one is in the mountains where it cools off in the evening.

Chiengmai is a city of about thirty-five thousand inhabitants and lies at the northern terminus of the railroad 450 miles north of Bangkok and about 75 miles east of the Burma border. The city sprawls along the Me Ping River in the middle of a wide plain surrounded by hills. The plains are intensively cultivated for rice, with occasional patches of dry scrub forest.

The Chiengmai plain (1100 ft.) is bounded on the north and west by high mountains. The nearest and directly north is Doi Soutep, its granite summit rising 5000 ft. almost like an island in the plain. Northeast of Soutep looms Doi Dao (7150 ft.), a great limestone "massif" of many peaks whose summit is usually shrouded in mist and fog. This mountain, because of its geology, has numerous caves and jagged pinnacles. A sacred cave temple at its base is a place of pilgrimage for Siamese from many parts of the country. It was close to this temple that we had one of our camps. About fifty miles southwest of Soutep lies a range called Doi Intanon, which is locally known to the natives as Doi Angka. This is the highest mountain in Siam and rises to 8448 feet (official height) although it is not spectacular as seen from a distance, and it is less well known than the two other peaks closer to Chiengmai.

In general the vegetation of these mountain ranges was essentially similar. The first 1800 feet was covered with a dry deciduous forest of oak and bamboo, the ground underneath having plenty of loose stones and not very dense underbrush, except for bamboo thickets. From 1800 to 4500 feet, there was a zone of pine and oak forests with heavy undergrowth and occasional second growth tall grass and brush, which has filled up the agricultural clearings of mountain Karens. There was a considerable fringe of evergreen along the streams at the bottoms of the rivers. From 4500 to 7000 feet on Mt. Angka we found tall tropical evergreen forest with thick undergrowth, especially in the valley bottoms, while there was more open forest on the slopes. From 7000 feet to the summit the trees became stunted and gnarled. There was an increasing amount of coarse grass about three feet high where blowdowns had exposed the slope, but most of the upper ridge was thickly forested with dwarf trees heavily laden with epiphytic moss that also covered the ground. At the very summit was a depression in the mountain that reminded one of an old crater in which lies an open

grassy bog of several acres. From the account of my friend, Baron de Schauensee, the summit of Doi Dao was quite open and grass-covered, whereas there was no open vista in any direction from the summit of Mt. Angka.

On our arrival in Chiengmai on February 16 with two bird collectors, Lucas Bah and Peter Cheron from Bangkok, we were warmly welcomed by Rev. William Harris of the Presbyterian Mission, the principal of Prince Royal's College. He had engaged a native staff for us, and procured a splendid house overlooking the Me Ping River which was to serve as our base during three months in the Chiengmai area. He and Dr. E. C. Cort, director of the McCormick Hospital, helped us in every possible way.

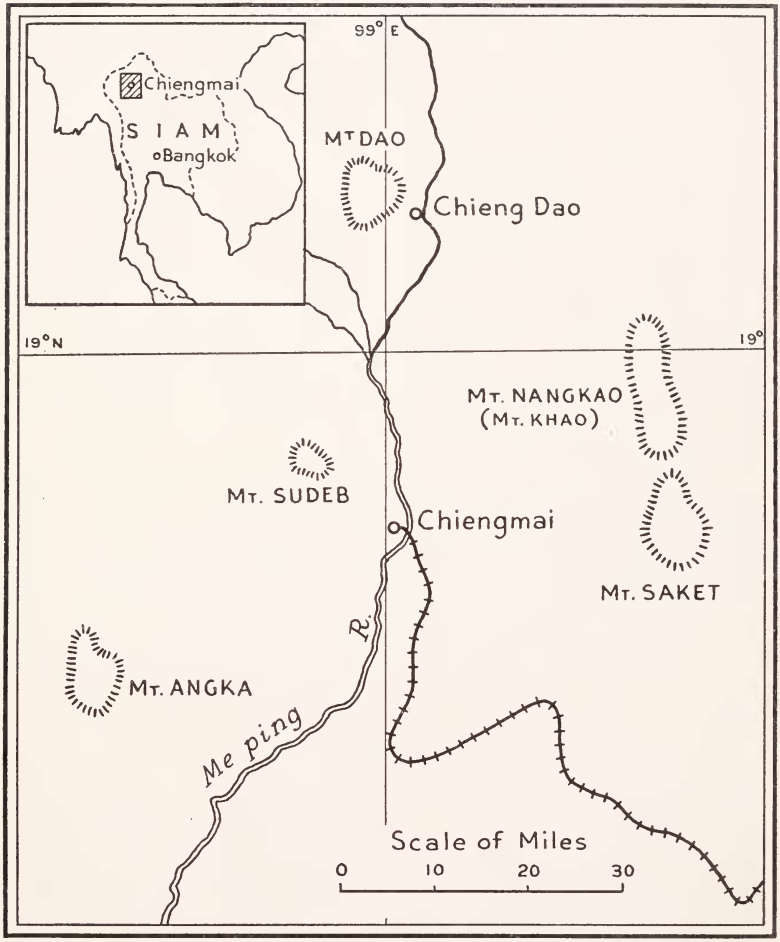
A few days were spent in scouting expeditions in various directions from Chiengmai, and as a result we decided to do our principal collecting on Doi Angka. To reach the base we had to go 70 kilometers, over a very rough road in a rented Siamese bus to a place called Mehoi. There porters were waiting by arrangement with the local "Amphur" who was very cooperative. We selected a place for our base camp near a former camp-site of the botanist Garrett at about 4300 feet on the edge of a small stream in a grove of tall trees, and not five minutes' climb from the lower edge of the high primary tropical forest belt. From Mehoi it was a two days' climb of 28 kilometers with ninety porters and a few pack ponies to the base camp. Much of the way the trail was not steep, and followed along the edge of a winding stream which was frequently used for bathing. This was a most welcome relief as the days were hot.

The porters that carried our equipment up the mountain to Camp 1 were Laotians, mostly farming coolies, from the Chiengmai plain. They carried 20 pounds on each of opposite ends of a bamboo pole which they balanced on their shoulder. They were paid one tical a day (about 45 cents U. S.) while loaded, and returned on their own time.

Four kilometers from our base camp was a Karen village. The Karens are quite primitive mountain people most of whom live over in Burma. They have some livestock and grow rice in terraced fields in the flatter mountain valleys between three and five thousand feet. We found Karens slow to take interest in zoological collecting, although one or two developed into good hunters and they were most useful as porters from our base camp to the higher camps, although generally lazy and slow minded.

Two hours from Camp 1 in another direction was a Meo village. The Meos are wilder than the Karens and very much more at home in

the forest. Many of them are good hunters and trappers and seem to go in very little for agriculture. Their huts are built of crude hand-



Sketch map of a section of Northern Siam to show collecting localities of the Asiatic Primate Expedition (1937).

hewn boards and set directly on the ground and not up on poles like the Karen houses. The result is the Meos live with any livestock, especially pigs, that they may happen to own, while the Karens live above them.

Camp 1, our base camp, was made up of several substantial shacks thatched with banana leaves. This was on Mt. Angka and was in operation from Feb. 25 to April 27. Being at 4300 feet, close to a small brook on the lower edge of the primary forest, it combined several advantages. Below us we had a fine view down a long valley. Nearby were considerable clearings occupied by farms of mountain Karens, there were wild banana plantations, wooded ridges, and almost every type of forest to be found on the mountain within an hour's climb up or down from camp. Tongues of the primary forest above us extended into the valley nearby. We were within reach of a Karen and a Meo village, and in altitude about halfway up the mountain. It usually took two to three days for supplies and messages to reach us from Chiengmai by special runner. At the time we were there the air was hazy with smoke from native brush and forest fires that rage entirely out of control day and night at this time of year. In fact only backfires and a fortunate change of wind saved us from losing our entire camp and kit from one of these fires. Our camp menagerie included leopard and bear cubs, gibbons, two kinds of macaques, parrots, turtles, and a python.

Above Camp 1 about two hours' climb in the heart of the primary forest, was Camp 2 (5500 ft.) which was occupied principally by Carpenter during preliminary behavior studies of gibbons from March 2 to March 20. With him at different times were J. Coolidge and S. Washburn. Near this camp we found a beautiful and rare forest magnolia (*Manglietia Garrettii*) in full bloom.

An hour and a half climb above Camp 2 was our over-night Camp 3 (6000 ft.) which consisted of a crude lean-to with a tarp thrown over it. This was also in the primary forest, but at a point where there was much less underbrush and the steepness of the mountain was very much greater than at the lower camps.

Camp 4 (8075 ft.) was on an island in the bog at the summit of the mountain. Griswold, Lucas and Peter collected there from March 24 to April 1st and were visited by H. Coolidge, Washburn, and Schultz. This camp was a unique one. The island was covered with soft moss and shaded by giant azalea (*Rhododendron Veitchianum*) and rhododendron trees (*Rhododendron arboreum*) with small white orchids clustered along their trunks. The bog, although open to the sky and filled with short grass, was surrounded by heavy forest. Small mammal traps set under almost any log sometimes brought a 50% yield. A number of birds and bats were caught by means of a bird net. Species of small mammals were collected, including the first record of *Chodsigoa*

smithii south of China, and the waterholes in the bog showed signs of sambur, barking deer, and an occasional seladang or large leopard. We saw no tiger tracks at the summit camp and few lower down.

On March 23, Carpenter established a new base camp at Chieng Dao (1300 ft.) close to the cave temple at the foot of Mt. Dao primarily for behavior studies on undisturbed wild gibbon families. This was located in a semi-deciduous forest at the base of wooded steep limestone crags which made it at times possible to observe and photograph gibbons from blinds on trails along steep slopes, and thereby get a far better view of them above or on their own forest level, than watching from the ground below. There were ten living gibbons of varying ages which he had as pets in this camp and which were later brought back for the Puerto Rico colony. Washburn spent 3 weeks with Carpenter observing families of wild gibbons and doing some collecting, and H. Coolidge was at the Chieng Dao camp for a week during which time he and Carpenter made films and the first successful recordings of wild gibbon calls on acetate discs, some of them with the help of a specially designed semi-portable 6-foot parabolic reflector. A number of reptiles and a few small mammals were also collected at Chieng Dao. Most of the members of the expedition packed up the Siam collections and left Chiengmai on April 30th for Bangkok, Angkor, Singapore, and North Borneo. Carpenter continued his work at Chieng Dao until the latter part of June. He was joined at the end of May by his wife and sister-in-law from America. At the conclusion of his behavior studies he collected specimens of langurs, macaques, and selected specimens of gibbons to check his field identification as to sex, age, etc. Some of these he embalmed for future dissection.

After leaving Siam we visited Angkor and arrived in Singapore at the time of the Coronation Celebration. May 16th saw us on board of the cargo boat Kadjang on our six day trip to North Borneo. The party consisted of Schultz, Washburn, Griswold, my wife (who had come from America and joined us at Angkor), and myself. We were later joined in N. Borneo by H. G. Deignan, an ornithologist now on the staff of the U. S. National Museum, and his native collector, Charlie. The Borneo collecting was carried on in three sections, one on the West coast operating from Jesselton. This was Griswold's collecting trip on Mount Kinabalu from June 7 to August 20. He has described his journey in "Up Kinabalu" in the Scientific Monthly, Vol. 48, May and June, 1939, pp. 401–414; 504–518.

The second section had its base camp at Abai near the mouth of the Kinabatangan River not far from Sandakan. Here Schultz and Wash-

burn built themselves a comfortable camp in the clearing formerly occupied by Martin Johnson's village. They collected from June to August with the help of an able native staff, procured through the kindness of Mr. Harry Keith, the Conservator of Forests. Their attention was primarily devoted to orangs, gibbons, and proboscis monkeys, for which a special permit had been granted by the Governor, as well as langurs and macaques. Here they collected a new color phase of *Trachypithecus pyrrhus cristatus* and the rare *Presbytis sabana.* The same procedure of measurements and preservation was used as in Siam. Abai is on the edge of mangroves and extensive stretches of nipa palms; along the river there were also very fine tall "mengaris" with long rattans and climbing bamboos. Langurs and proboscis monkeys were very plentiful here, and orangs and gibbons not infrequent. The climate was hot and damp, making it necessary to pickle skins in brine for preservation. A three-year-old pet orang named "Dish-face" added to the gaiety of the camp. This was a confiscated animal, purchased through the courtesy of the government.

The third collecting unit was made up of Deignan and his Dayak boy, Charlie, who concentrated on getting us lowland birds from the primary forest close to Sandakan, from Morutai Besar, the Kalabakang River on the east coast, and from Abai. Deignan did his field collecting from June 20 to August 12.

On the return journey to Singapore, an exchange for some small mammals included in this list was arranged through the courtesy of Mr. E. Banks, Curator of the Sarawak Museum at Kuching. After Carpenter had completed his work in Siam, he spent a month until the middle of August making a survey of Atjeh, North Sumatra. J. Coolidge left the expedition on account of illness on April 1. Andrew Wylie collected some mammals for us in southern Annam, Indo-China, from February 22 to May 1.

The last unit of the expedition had completed all field work by September 1, 1937.

MAMMALS

By Glover M. Allen and Harold J. Coolidge, Jr.

The following list of mammals collected by the Expedition includes the descriptions of new subspecies of *Myotis, Pteromys,* and two *Callosciurus,* and an account of an *erythristic* mutant of *Trachypithecus.* In separate short papers, a new race of tree-shrew, *Tana tana griswoldi,* has previously been described by Coolidge from the specimens collected in Borneo, as well as a new pygmy fruit bat, *Aethalops aequalis* by Allen. In listing the langurs, we have in most cases followed Pocock's revision (Proc. Zool. Soc. London, 1934). Further detailed study of the series procured by the Expedition should furnish additional evidence to support or contradict his conclusions.

The following reports have been frequently consulted in the preparation of this list:[1]

Banks, E.
1931. A popular account of the mammals of Borneo. Journ. Malayan Branch, Roy. Asiatic Soc., vol. 9, pt. 2, 139 pp.

Osgood, Wilfred H.
1932. Mammals of the Kelly-Roosevelts and Delacour Asiatic Expeditions. Field Mus. Nat. Hist., Zool. Ser., vol. 18, no. 10, pp. 193–339, pls. 9–11.

Pocock, R. I.
1935. The monkeys of the genera Pithecus (or Presbytis) and Pygathrix found to the east of the Bay of Bengal. Proc. Zool. Soc. London, for 1934, pp. 895–961, Jan. 14, 1935.

Raven, H. C.
1935. Wallace's Line and the distribution of Indo-Australian mammals. Bull. Amer. Mus. Nat. Hist., vol. 68, pp. 179–293.

Ptilocercus lowii lowii Gray

M.C.Z. No. 35380 1 M. Borneo, Sarawak, Kuching.

(Coolidge) Type locality the island of Labuan where it has recently been rediscovered. They are procurable from natives in and around Kuching according to Banks. This specimen came to us by exchange from him.

[1] This report was in proof when Chasen's 'Handlist of Malaysian Mammals' was received (Bull. Raffles Mus., No. 15, 1940).

Tupaia belangeri chinensis Anderson

M.C.Z. No. 35773, 35810–21, 35823–7, 35829–30, 35834–5, 35837–42 9 M., 14 F. Siam, Mt. Angka.

M.C.Z. No. 35822, 35831, 35836 2 M., 1 F. Siam, Mt. Nangkeo (Souket).

M.C.Z. No. 35828 1 F. Siam, Chieng Dao.

Specimens from varying altitudes between 1500 and 8000 feet.

(Coolidge) At first we were unable to get any until natives understood just what we wanted. We found Tupaias in localized populations in old clearings or wild banana plantations usually running along the ground or fallen logs. They were very quick and nervous. One came within six feet of me as I was seated on a log. We made a collection of embalmed specimens for anatomical study and also of embryos.

Tupaia longipes Thomas

M.C.Z. No. 36811–12 1 M., 1 F. Borneo, Sarawak.

Tupaia minor minor Günther

M.C.Z. No. 36711 1 F. North Borneo, Kalabakang River.

M.C.Z. No. 36401–2 2 M. North Borneo, Mt. Kinabalu. Altitude 2000–3000 feet.

M.C.Z. No. 36809–10 2 F. Borneo, Sarawak, Kuching.

One of the smallest tree shrews. Common in Sarawak.

Tupaia montana montana Thomas

M.C.Z. No. 36813 1 F. Borneo, Sarawak.

Highland form, mainly terrestrial. Found on Mts. Penrissen, Poi and Dulit about 3000 feet.

Tupaia montana baluensis Lyon

M.C.Z. No. 36128–132, 36136–145, 36404–415, 36417–449 32 M., 28 F. North Borneo, Mt. Kinabalu. Altitude 3500–9790 feet.

Has a remarkable resemblance to *Funambulus everetti;* likewise found only on mountain tops. Largely terrestrial. It is both nocturnal and diurnal. Like all these high altitudinal animals this Tupaia has a heavy, thick fur, probably on account of cold and dampness.

TUPAIA PICTA Thomas

M.C.Z. No. 36806 1 M. Borneo, Sarawak.

Little known about habits. Found in Baram area of Sarawak.

TANA DORSALIS (Schlegel)

M.C.Z. No. 36807 1 F. Borneo, Sarawak.

Terrestrial; found in most parts of Sarawak but not noticeably above 3000 ft.

TANA TANA GRISWOLDI Coolidge

M.C.Z. No. 36416 1 M. North Borneo, Mt. Kinabalu. Alt. 3300 ft.

See A New Tree Shrew of the Genus Tana from Mt. Kinabalu, North Borneo, Proc. New Eng. Zoöl. Club, 17, pp. 45–47, May, 1938. According to Chasen's recently published 'Hand list of Malaysian Mammals' (Bull. Raffles Mus., No. 15, p. 6, 1940) this is the same as *Tupaia tana chrysura*. A further comparison of the type with a *Tupaia tana chrysura* in the collection of the United States National Museum clearly shows that *chrysura* has a buffy tail and light feet which is clearly distinct from the dark tail and black feet of *griswoldi* hence could not belong to the same race.

TANA TANA UTARA Lyon

M.C.Z. No. 36748 1 F. Borneo, Sarawak, Kuching.
No. 36808 1 M.

One of the largest Tupaias and almost wholly terrestrial.

DENDROGALE MELANURA Thomas

M.C.Z. No. 36381–4, 36386–400 8 M., 11 F. North Borneo, Mt. Kinabalu.

(Griswold) Found from 4- to 11-thousand feet; active both by night and by day. One shot running up a tree. Would range lower if primary forest extended lower down.

HYLOMYS SUILLUS DORSALIS Thomas

M.C.Z. No. 36147–176 18 M., 12 F. British North Borneo, Mt. Kinabalu.

Numerous on Mt. Kinabalu in primary forest 4- to 11-thousand feet.

Hylomys siamensis Kloss

M.C.Z. No. 35452–3 2 F. Siam, Mt. Angka. Alt. 4300 ft. Type from Hinop, Eastern Siam.

Trapped in metal box-trap under a log in a grove of wild bananas close to camp.

Echinosorex rafflesii (Horsfield)

M.C.Z. No. 36814 1 M. Borneo, Sarawak.

Talpa klossi Thomas

M.C.Z. No. 35381–4 4 F. Siam, Mt. Angka.

Dug out of garden by a native at 4000 ft.

Chodsigoa smithii parca G. M. Allen

M.C.Z. No. 35448–51 1 M., 3 F. Siam, Summit of Mt. Angka.

First record of *Chodsigoa smithii* south of China, and second record of any *Chodsigoa* (first was *lowei* at Chapa—Osgood).

All trapped at 8000-foot summit camp only.

In same traps with *Anourosorex*.

Crocidura baluensis Thomas

M.C.Z. No. 36541, 36546–7, 36549–50, 36554–57, 36560 4 M., 6 F. North Borneo, Mt. Kinabalu.

(Griswold) Found at 9, 10, 11 and 12 thousand feet, in mossy stunted low bushes, stunted trees, rocks, short grass—not forest.

Crocidura doriae Peters

M.C.Z. No. 36548, 36551–3, 36558–9, 36561–73, 36575 6 M., 13 F., 1 ? North Borneo, Mt. Kinabalu. Alt. 3080–11000 ft.

Crocidura foetida Peters

M.C.Z. No. 36574 1 F. North Borneo, Mt. Kinabalu. Alt. 5500 ft.

Native trap in forest at Lumu Lumu.

Crocidura vorax G. M. Allen

M.C.Z. No. 37427 1 alc., Siam, summit of Mt. Angka. Alt. 8075 ft.[1]

Suncus caeruleus (Kerr)

M.C.Z. No. 35809. Borneo, Labuan, Victoria.

The only specimen of this shrew was picked up dead in the road by H. G. Deignan and preserved as a skin. That none are secured at higher levels may indicate that it is introduced in the lowlands.

Anourosorex squamipes Milne-Edwards

M.C.Z. No. 35500–17 5 M., 11 F., 2 ? Siam, Mt. Angka.

Trapped only at the 8000-foot summit camp where they were very plentiful.

Crossogale phaeura (Thomas)

M.C.Z. No. 36542–45 4 F. North Borneo, Mt. Kinabalu. Alt. 3080–5500 ft.

Natives say they occur along the water.

Galeopterus variegatus borneanus Lyon

M.C.Z. No. 36801 1 M. Borneo, Sarawak.

Rousettus leschenaulti (Desmarest)

M.C.Z. No. 33081 1 F. Siam, Chieng Dao.
No. 33082 1 infant M. Siam, Chieng Dao.

Cynopterus brachyotis angulatus Miller

M.C.Z. No. 35475–8 3 M., 1 F. Siam, Mt. Angka. Alt. 4380 ft.

Cynopterus brachyotis brachyotis (Müller)

M.C.Z. No. 36630–667, 36680–684 20 M., 23 F. North Borneo, Mt. Kinabalu. Alt. 3080–5500 ft.
M.C.Z. No. 36752 1 M. Borneo, Sarawak, Kuching.

[1] All altitudes taken from expedition barometers.

(Griswold) Natives told me that they hang the thorny branches of the rattan palm on fruit trees, and often impale many fruit bats that come to devour the fruit.

Penthetor lucasi (Dobson)

M.C.Z. No. 36751 1 F. Borneo, Sarawak, Bidi Caves.
No. 36686–701 14 M., 2 F. North Borneo, Mt. Kinabalu. Altitude 4790 ft.

(Griswold) All these bats were caught at Labang Cave. This is nothing but a huge overhanging rock by a little stream, which is the beginning of the Kadamaian River. The natives sometimes made excursions there to secure bats to eat, as could be seen by the branches left at the mouth of the cave, which they used to knock the bats down. The native I went with made a sacrifice of rice and called to the spirits of the mountain before he would enter. Most of the bats would leave at the slightest noise.

Sphaerias blanfordi (Thomas)

M.C.Z. No. 35446–7 2 M. Siam, Mt. Angka.

On stream at 4000 ft. near base camp in bird net. The first record for Siam.

Aethalops aequalis G. M. Allen

M.C.Z. No. 36582–84, 36586 4 F. North Borneo, Mt. Kinabalu, Lumu Lumu.

This new species was taken in a bird net stretched in the forest, and is the first record of the genus for Borneo.

Pteropus vampyrus natunae Andersen

M.C.Z. No. 36818 1 F. Borneo, Sarawak, Kuching.

Rhinolophus acuminatus Peters

M.C.Z. No. 36095–36104, 36588–604 15 M., 12 F. North Borneo, Mt. Kinabalu. Altitude 3500–5500 ft.

Rhinolophus affinis macrurus Andersen

M.C.Z. No. 35494 1 F. Siam, Mt. Angka. Altitude 4300 ft.

RHINOLOPHUS BORNEENSIS Peters

M.C.Z. No. 36081 1 F. North Borneo, Mt. Kinabalu. Altitude 3500 ft.

RHINOLOPHUS LUCTUS Temminck

M.C.Z. No. 36605–7 3 F. North Borneo, Mt. Kinabalu.

All caught at 4900 ft.

HIPPOSIDEROS ARMIGER ARMIGER Hodgson

M.C.Z. No. 35483–93 5 M., 6 F. Siam, Mt. Angka. Altitude 4300 ft.

MYOTIS ABBOTTI NUGAX subspecies nov.

Type. Adult male, skin and skull, no. 36076 Museum of Comparative Zoology, from Bundutuan, Mt. Kinabalu, North Borneo, 3500 feet altitude; collected July 25, 1937, by the Asiatic Primate Expedition, J. A. Griswold, Jr.

Description. A small-footed, dark-brown species, in general resembling *Myotis abbotti* of the Pagi Islands, off southwestern Sumatra, but with much shorter tibiae.

Dorsal coloration a uniform dark brown with a faint chestnut tint, about 'Prout's brown' of Ridgway, the forehead slightly paler, tinged with grayish and lacking the chestnut. On parting the fur, the brownish tint of the tips of the hairs is seen to grade imperceptibly into the slaty black of the extreme bases. On the under side of the body the fur is everywhere slaty black at the base, tipped on the throat with ashy, which passes into a soiled yellowish, nearest 'honey yellow', over the breast and abdomen. The membranes and rather narrow ears are dull brownish.

One or two individuals of the series are more reddish above, nearly 'cinnamon brown'. Immatures are duller above with less of the brown tipping to the fur, and the tips of the hairs on the under surface are whitish over the breast and abdomen as well as on the throat.

Measurements. The field measurements of the type are: total length, 86 mm.; tail, 36; ear, 11; tragus, 5. Additional measurements from the well-prepared skin are: forearm, 38.5 mm.; tibia, 14.4; hind foot, extended, with claws, 7.4; third metacarpal, 35.9; first phalanx of same, 13.3; second phalanx, 14.4.

The skull measures: greatest length, 14.5 mm.; basal length, 12.5; palatal length, 8.6; zygomatic width, 19.5; mastoid width, 7.5; width

across molars, 6.4; upper tooth row, 6.0; length of mandible, 11.2; length of lower tooth row, 7.2.

The skull is delicate and of the usual form in the small bats of the genus, with long rostrum and gently sloping profile. The first and second upper incisors are subequal, the inner with a minute posterior, the outer with a similar internal cusp. The first upper premolar is nearly triangular in section as seen from ventral view, with a minute cingulum and a blunt point which barely exceeds the cingulum of the canine. The second premolar is minute, slightly internal to the axis of the tooth row and hidden from the outside in the angle between the first and the third premolars, or it may be, as in the type, lost. The first and second upper molars have a well-marked inner cingulum, but the hypocone is barely traceable. In the lower jaw the small second premolar is minute and crowded inward from the tooth row, but the two others are not quite in contact.

The small-footed bats of this type, occurring in Borneo and other East Indian islands, have usually been included under the specific name *muricola*, but with a series of skins at hand, it becomes evident that the typical *Myotis muricola* of Nepal and the Himalayan foothills of India is quite a different animal, having long shiny ochraceous tips to the hairs of the upper side, besides differing in slightly smaller proportions, while the representative of the species in the East Indies is browner, without noticeably long burnished tips, and with a yellowish wash below instead of whitish. Lyon, in 1916 (Proc. U. S. Nat. Mus., 52: 441), described as *Myotis abbottii* this type of small bat from North Pagi Island, off southwestern Sumatra, with a forearm measurement of 38 mm. and tibia of 16.8 to 17.2 mm. The series from Borneo agrees essentially with his description except that the tibiae are markedly smaller. He supposed that this species was confined to the Pagi Islands, although it may be that specimens from the main island of Sumatra will not be found to differ very much. In the same paper he named as *Myotis niasensis* the slightly smaller form found on Nias Island, with a forearm of only 31.2–34.5 mm., and tibia 14–16.4 mm. With these dimensions agrees a small series in the Museum of Comparative Zoology from Java, but whether the two are in fact identical cannot yet be said. At all events, the representative of this group collected on Mt. Kinabalu more nearly agrees with *M. abbotti* and may for the present stand as a race of it. With the series are two very small young perhaps still unable to fly, taken on July 23 and 24, respectively. In addition to these, the series includes eight adults from

the type locality, taken July 24 and 25, and four others, July 15 and 17, from Tenompok, at 4900 feet on the mountain, M.C.Z. No. 36072–80, 36082–83, 36085–89, 36091.

Pipistrellus sp.?

M.C.Z. No. 36094 1 F. North Borneo, Mt. Kinabalu. Alt. 3080 ft.

Pipistrellus nitidus (Tomes)

M.C.Z. No. 36084, 36090, 36092–3 3 M., 1 F. North Borneo, Mt. Kinabalu.

All came from Tenompok, alt. 4900 ft.

Ia io Thomas

M.C.Z. No. 35479 1 M. Siam, Chieng Dao.

In Temple Cave. The first record outside of China.

Scotophilus gairdneri Kloss

M.C.Z. No. 35495 1 M. Siam, Mt. Angka. Alt. 4300 ft.

Miniopterus ? pusillus Dobson

M.C.Z. No. 35496–9 3 M., 1 F. Siam, Mt. Angka. Alt. 4300 ft.

Nycticebus bengalensis cinereus Milne-Edwards

M.C.Z. No. 38607–9, 35942 3 M. 1 F. Siam, Chieng Dao.
No. 35952 1 F. Siam, Mt. Angka. Alt. 4300 ft.

Nycticebus borneanus Lyon

M.C.Z. No. 36040–41 2 M. Borneo, Baram.
No. 36116 1 F. North Borneo, Jesselton.
1 F. North Borneo, Sandakan.

Nycticebus pygmaeus Bonhote

M.C.Z. No. 36035 Indo-China, southern Annam, Ban Me Thouet.

A single specimen of this very distinct species was secured by Andrew Wylie.

Tarsius tarsier (Erxleben)

M.C.Z. No. 35379 1 M. Borneo, Tabekang.

Presbytis chrysomelas Müller

M.C.Z. No. 36822, 36815 1 F., 1 juv. Borneo, Sarawak.

The female specimen was collected by Sliman at the foot of the Kalinkans Mts. This is clearly the black and red *crucifer* with crown, flanks, and outer surfaces of the legs red; the dorsal black band covering the whole of the back, white and reddish hairs on the abdomen and inner side of legs and arms. There is no gray on the throat and the white inner leg stripe is 13 mm. wide, an inch above the ankle. We agree with Pocock's opinion that this is an *erythristic* mutant of the blackish form *chrysomelas*. The juvenile is a young of the typical dark form.

Presbytis hosei Thomas

M.C.Z. No. 36816 1 F. Borneo, Sarawak.
M.C.Z. No. 37370–72 1 M., 1 F., 1 juv. Borneo, Mt. Kinabalu.

Our skins confirm the conclusion of Chasen and Kloss in 1931 as pointed out by Pocock that the adult female departs in head pattern from the normal coloration of the species which led to the description of *everettii*. Our juvenile female has the head pattern of the adult male which differs from the two adult females.

(Griswold) Although I never personally shot this species, I saw one small group at 4000′ and a single specimen at about 3000′. It only occurs in primeval forest and is rare on Kinabalu.

Presbytis rubicunda Müller

19 M., 21 F., 6 juv., 2 inf. North Borneo, Kinabatangan River, Abai.
1 M., 1 F. Mt. Kinabalu, North Borneo.

This material will be used in a later study of variation in coat characters of Bornean langurs. It is interesting to note here that Schlegel described the newly-born young as white without the cruciform pattern, turning ruddy at an early age. Our infants show two phases: one with white arms and legs and light ruddy hairs on the head, the entire back and the upper side of the tail with traces of black forming a narrow central line down the lower half of the tail. The second infant has dark brown hairs on the back, the arms and legs are turning

ruddy and there is a blackish brown area the whole length of the center of the tail. Fine blackish gray hairs are on the backs of fingers and toes of both infants.

(Griswold) Seems to be confined to the high forest. Banks records two from Mt. Murud at 6000′, at about which altitude I secured my specimen. It was in company with one other and was silently eating about twenty feet from the ground. It was the only specimen I saw alive, and doesn't seem to be common on Kinabalu.

Presbytis rubicunda ignitus Dollman

M.C.Z. No. 36820 1 M. Borneo, Sarawak, Baram.

No blackness about the hands and feet, differing in this from a considerable series of *Presbytis rubicunda.*

Presbytis sabana Thomas

M.C.Z. No. 35621, 35625 1 F., 1 inf. North Borneo, Abai.

The adult skin is similar to *hosei* in color of body, tail and limbs but the hair of the cheeks and temples is black and there is no white on the head, which is grayish black with a pale whorl patch on each side of the crown in front where the bases of hairs radiating from the whorls are exposed. The long black bristle hairs on the hair line of the forehead are 38 mm. long as compared with 20 mm. on two adult *hosei* specimens. *Sabana* has a larger white forehead area between the eyes and the hair line than is found in *hosei.* The black skin below the eyes does not extend to as great a height on either side of the nasal ridge in *sabana* as in *hosei.* The white hair of the abdomen has less brilliance than in *hosei* and has scattering gray hairs among it. While the black hairs on the back of the hands are similar to *hosei,* on the legs the black is confined to below the ankle in *sabana* and extends half the way up the leg in *hosei.* The white hairs on the inner side of the upper leg extend lower down in *hosei* than in *sabana.* The following measurements indicate the larger size of the *sabana* as compared with an adult male and female *hosei,* although a two pound weight difference is within the individual variation range of the closely allied *rubicunda.*

	Sabana Female	*Hosei Male*	*Hosei Female*
Weight:	14½ lbs.	—	12½ lbs.
Total Length:	1275	1174	1055
Tail Length:	755	709	600
H. F. Length:	177	172	150

The infant *sabana*, of which I can find no recorded description, is largely white with a gray stripe about 17 mm. wide extending from behind the shoulder to the tip of the tail, while the underside of the upper half of the tail has a narrow white stripe, the lower half is all gray. There are scattered long black hairs on the cheek and a fringe of long black hairs along the forehead hairline. There are two small whorls on either side of the midline just above the forehead. The head is covered with soft short white hairs with a sprinkling of gray. There is a small central crest on top of the head. There are gray hairs mingled with white on the hands, feet, and lower arms. The small callosities are a greenish color. The skin resembles in many ways the young of *hosei* described by Chasen and Kloss in 1931. The infant weighed 1¼ lbs. and measured T. L. 575; T. 340; H. F. 93; E. 18; trunk height 131.

Historical

Hitherto our recorded knowledge of this monkey rare in collections is limited to Thomas' completely original description of two males obtained by A. Everett at Paitan in N. Borneo (Thomas, Ann. & Mag. Nat. Hist. (6) XII, p. 230, Pl. VII, 1893) and Chasen and Kloss' description of the first female specimen which they procured at Betotan (Chasen and Kloss, Bull. Raffles Mus., Singapore, No. 6, p. 7, 1931). Ours agrees with their description except for the fact that our female has gray patches on either side of the crest and vertex, with mainly black hairs on the crest, resembling more Thomas' description of the male in this respect and confirming Pocock's opinion (p. 923, Proc. Zool. Soc. London, 1934). There is also a specimen in the Field Museum from North Borneo. Washburn reports that natives said these langurs were more numerous higher up the Kinabatangan River than Abai.

TRACHYPITHECUS PYRRHUS GERMANI Milne-Edwards

M.C.Z. No. 37746–48 2 M., 1 juv.F. Indo-China, S. Annam, Ban Me Thouet.

We agree with Pocock and Osgood that there is no distinct evidence for separating *margarita* from *germani*. The resemblance between *germani* and our series of Bornean *cristatus* is most striking.

TRACHYPITHECUS PHAYREI CREPUSCULUS Elliott

7 M., 13 F., 4 juv., 4 inf. Siam, Chiengmai, Mt. Angka and Chieng Dao.

We follow Pocock although this langur agrees very well with Kloss' description of *argenteus*. Our specimens are uniformly pale silver gray

with dark hands and feet and light gray on the abdomen. They probably resemble the paler skins of the series secured by A. S. Vernay east of Um Pang on the Mewong River, Siam, referred to by Pocock (Fauna of British India, Vol. I, p. 135, March, 1939). The pale eyelids and pale patch on the mouth, the uniform colored tail and dark hands and feet, in spite of the absence of a "cap", would suggest that we are dealing with a race of the general *obscurus* type resembling in some respects *phayrei*, which may well be even from many of the characters set forth by Pocock but another race of *obscurus*. The young are golden.

Trachypithecus pyrrhus cristatus Raffles

15 M., 26 F., 10 juv., 7 inf. North Borneo, Kinabatangan River, Abai.
6 M., 8 F., 5 juv. North Borneo, near Jesselton.

This series varies in the silveriness of the tips of the hairs and will be used in later studies of variation both in skeleton and in coat characters of Bornean langurs. The most striking thing about it is the occurrence of an erythristic mutant obtained by Washburn and Schultz.

These orange-cinnamon phase langurs show no significant skull or skeletal differences from the gray *cristatus* with which they were associated. They do show a very marked skin and coat color difference in the adults and a less marked but still distinguishable difference in the infant. An adult female of the light phase has the same hair pattern on head, body, arms, and legs as the dark form. In the light phase the bare skin of face, hands, and feet is light with a freckling of dark pigment spots which is particularly heavy in the area around the nose and mouth.

In the dark form there is a uniform dark pigment in these areas of hairless skin. In the light phase the hairs of the head, shoulders, arms, legs, are orange-cinnamon under certain lights in the same areas. The hairs are dark mouse gray in the dark form. At other angles tips of the hairs appear spangled with silver in both forms. This silver gray is prevalent on the back of the crest, the arms, legs, and tail of both forms. The underside of the tail is silver gray in both forms.

In comparing infants of approximately equal weight and size, we find the hair on the light phase infant is considerably longer and not so fine as that of the dark phase. There is a better developed crest and longer hairs around the ears in the light phase. The hairs on the back, belly, arms, legs, and upper tail give a spangled effect because of the large number of silver gray hairs which are so characteristic of the adult. The dark phase infant has none of these hairs. He may be a

slightly younger animal. In the light phase infant, the hair on the head, back, arms, legs, and tail is an almost uniform light orange-cinnamon which grades into a silver white on the sides, stomach, and underside of the upper quarter of the tail.

The dark phase infant has short wavy hairs on his back and the ground color of the back of his head, his back, tail, arms, and legs is a uniform light orange-cinnamon without the silver-gray hair tips of the light phase. The dark phase infant has black brow lashes, and a sprinkling of black hairs on the front of his head. He has a concentration of black and gray hairs on the backs of his hands, and the backs of his feet. There is more gray in the feet than in the hands. His tail is not silvered on the under side and is more uniformly brownish and short haired than that of the light phase. An even younger infant of the adult dark phase shows exactly similar markings.

By way of summary, the light phase infant has a longer and better developed coat with many silver tipped hairs by contrast with the short, soft, wavy haired dark phase infant. The light infant shows no trace of dark pigment which is evident in the hairs on the forehead, hands, and feet of the dark phase infant as well as in the skin of face, hands, and feet.

The field measurements of all age groups show no significant differences between the light phase and the dark phase. Neither does a comparison of their skeletons.

Seven out of fifteen adult males collected at Abai were light phase and only three out of twenty-six adult females. This indicates that about 46% of the males collected in this area are light as against 12% of the females. The collectors were not instructed to concentrate on any kind. In a collection of six adult males and eight adult females from near Jesselton on the northwest coast of Borneo not a single specimen showed the light phase. Counting all age groups, the series from Abai totalled 58 of which 14 or about 24% were of the light phase.

Mutants are not uncommon in Bornean langurs. There is, for example, *cruciger* which Pocock, Chasen and Kloss agree is a red mutant of *chrysomelas*. Pocock points out reddish and whitish mutants of *Presbytis melalophus*. He also adopts the name *Trachypithecus pyrrhus* for the typical Javan form whose dominant color phase is nearly jet-black, although the name *pyrrhus* was given by Horsfield to a couple of red mutants both female and now in the British Museum. He uses this name instead of *maurus* or *auratus* under which it has often been cited. The type of *C. auratus* comes from an unknown locality.

On the shafts of the hairs in the light phase is an occasional sprin-

kling of dark pigment that is only noticeable on close examination and gives the effect of fine grain dark pepper having been spilled on the skin. Under the microscope these turn out to be bits of dark pigment of the color found in the dark form.

In comparing the coat colors of juvenile forms we find the same color differences as in the adults.

In comparing the coat colors of two male infants of about equal age and size, each weighing one pound, we find a completely light skin color on the face, hands and feet of the orange phase and a grayish brown pigmented skin on the face, hands and feet of the dark phase.

Mr. Sherwood L. Washburn deserves special thanks, not only for the able way that he collected and prepared this material, but also for his field investigation which determined that three specimens in our series came from families or groups containing both gray and orange *cristatus* which strengthens the conclusion that we are here dealing with a mutation of the gray form of *cristatus*.

Pygathrix nigripes Milne-Edwards

M.C.Z. No. 36224, 36259, 37745 1 F., 1 M., 1 inf. M. Indo-China, S. Annam, Ban Me Thouet.

This striking looking langur is rare in collections. The question of its relationship to *nemaeus* has been discussed by Thomas (1928).

The infant male shows the same color pattern as that which is found in the adult female. He only lacks the reddish brown collar on the underside which is found in the male although he shows traces of it on the side. The grayish white hairs are not annulated on the abdomen of the infant or the adult female, as they are in the adult male. Examination of an adult male and female in the Field Museum shows more annulation on the female than the male. This must be an individual character of no sexual significance.

Nasalis larvatus (Wurmb)

9 M., 13 F., 6 juv., 7 infs. North Borneo, Kinabatangan Riv., Abai.

These langurs were plentiful in the heavy stand of nipa palms in the mangrove swamps close to our camp at Abai on the Kinabatangan River. One male that was collected weighed as much as 52 pounds. These Proboscis Monkeys were found in troops up to twenty in number. Martin Johnson had his camp in the same locality two years before and made fine pictures of captive *Nasalis* which were released in

his film entitled "Borneo" shortly after the tragic accident in which he lost his life.

Macaca assamensis coolidgei (Osgood)

M.C.Z. No. 35920, 37710 1 M. 1 juv. Siam, Mt. Angka. Alt. 6000 ft.
No. 37704–5 2 M., 2 F. Siam, Chieng Dao.
No. 37707–8.

The skins from specimens obtained at Chieng Dao are generally cinnamon brown on body, shoulders, back, rump, arms, legs, and tail. The under parts and inner sides of arms, and legs are soiled whitish. The brownish hairs are generally mouse color basally and apically cinnamon brown, sometimes with black tips. The face color is generally dark. The hairs grow directly back from the forehead. These differ from typical *assamensis* as represented by skins from Sikkim in the Field Museum collection because they lack the reddish area around the shoulders. They have no oval of black hair about a central whorl on top of the head. They have less heavy coats, and shorter tails than the skins from Sikkim. They resemble more closely *coolidgei* although they are paler and browner than this Indo-China form described by Osgood, and have a less heavy coat. They may well represent an extreme variation of *coolidgei* away from typical *assamensis* although they are geographically nearer to the range of the latter than are Osgood's specimens. The adult male and juvenile female from 6000 feet on Mount Angka have very much paler arms and legs and more gray and white on the face, head and neck than those from Chieng Dao. The hair on the back of the head and shoulders is long as might be expected in a mountain form. The male has a central whorl 22 mm. back of his forehead hairline and the juvenile a whorl 12 mm. back. The juvenile mountain specimen has a hairless tail and the male a scantily haired tail. The skulls are essentially similar to those of the *assamensis* specimens. The adult male's measurements are: L. 602, T. 216, H. F. 167, E. 41, Wt. 17½ lbs. The collectors' measurements on a *coolidgei* recorded by Osgood from Chapa, Tonkin, give a tail length of 215; hind foot 167. These two Siam mountain specimens probably represent extremes in a pale variation of *Macaca assamensis coolidgei* although more material may justify referring them to a different race.

Macaca irus Cuvier

21 M., 24 F., 35 juvs., 4 inf. North Borneo, Kinabatangan River. and Jesselton.

This macaque seems to be equally at home in the mangroves of the coastal rivers and 4000′ up on the mountains. The largest male we collected weighed 15 lbs. and the largest female 9½ lbs.

Macaca irus aurea Geoffroy

1 sub-adult M. S. E. Siam, Arranya.

Our specimen agrees with the main characters of *aureus* (Pocock—Fauna of British India, Vol. 1, p. 79, March 1939). "The hairs of the temple and under part of the cheek sweep backwards from the face, partly concealing the ear, then downwards and forwards towards the corner of the mouth and finally upwards, the general arrangement being circular and resulting in a definite whorl and a small crest low down on each side of the muzzle." In addition, our skin has a heavy sprinkling of black hairs and brown hairs with black tips on the crown of the head. This forms a distinct whorl in the median line 50 mm. back of the forehead hairline. Behind this whorl the hair slopes from either side of the top of the head meeting to form a small crest which extends for 35 mm. back from the central whorl. The general hue of the upper side is olivaceous brown due to the ochreous annulations of the hairs. The limbs are gray, lighter on the underside. The tail is dark gray with a light underside. The hairs on the abdomen are white.

As Pocock points out this is a race variable in color and size. He gives its distribution as Lower Burma, Tenasserim, Mergui Archipelago, and S.W. Siam. Our specimen indicates an extension of the range to S.E. Siam.

Macaca mulatta (Zimmerman)

M.C.Z. No. 37706 1 M. Siam, Chieng Dao.

This rhesus specimen is unusually bright colored. It has a pale face with shoulders, back, tail and upper leg a light ochraceous buff on the apical ends of mouse gray hairs. The hairs on the arms are cinnamon brown but the hairs on the sides and front of legs are also ochraceous buff.

Macaca nemestrina (Linnaeus)

M.C.Z. 35598, 35687, 35631, 35635, 35589, 35646, 35670 2 M., 4 F., 2 juvs. North Borneo, Kinabatangan River, Abai.

M.C.Z. 37419, 374229 2 juvs. North Borneo, Mt. Kinabalu.

The largest male weighed 22 lbs. and the largest female 14 lbs.

MACACA (Lyssodes) SPECIOSA Cuvier

M.C.Z. No. 37022 1 juv. Indo-China, S. Annam, Ban Me Thouet.

HYLOBATES LAR (Linnaeus) ? subsp.

North Siam, Chiengmai, Mt. Angka and Chieng Dao.

Our considerable series includes complete skeletons and shows some of the characters attributed by Kloss to typical *Hylobates lar lar* and some to *lar entelloides*. One of us has in preparation a detailed study of the coat characters in this series which when completed should definitely indicate the race we are dealing with and the extent of possible color variation in a localized area. Both black and light phases are represented. Dr. A. Schultz has in preparation a study of growth and variation in gibbons largely based on this material, much of which he measured in the field and personally helped to prepare. Reproductive tracts and embryos have been turned over to Dr. George Wislocki of the Harvard Medical School.

HYLOBATES MOLOCH[1] FUNEREUS (I. Geoffroy)

4 M., 3 F., 4 juvs. North Borneo, Kinabatangan Riv., Abai.
1 F. North Borneo, Mt. Kinabalu.

Our specimens agree with those assigned by Kloss to this race of Bornean gibbon and come from close to the same locality where he and Mr. F. N. Chasen obtained 3 males and 3 females in 1927.

(Griswold) The single specimen that was collected on Kinabalu was shot around 5000′. The cheery gibbon call could be heard almost every morning around the altitudes of 4000′ to 5000′. These apes were scarce, as neither I nor my native collectors ever saw but one group during my 1½ month stay at Lumu Lumu.

HYLOBATES MÜLLERI Martin

M.C.Z. No. 35881 1 M. S.E. Borneo, 13th mile.

PONGO PYGMAEUS (Hoppius)

M.C.Z. No. 37358–65 2 M., 3 F., 2 juvs. North Borneo, Kinabatangan River, Abai.

The Orang appeared to be quite plentiful along the lower Kinaba-

[1] Vide Cabrera, P. Z. S., 1930, p. 257.

tangan River. It was reported locally that the natives of the region are very apt to shoot them in spite of the protective laws.

(Griswold) Labuan saw an Orang utan at 6000 ft., just below camp. It is undoubtedly very rare at this altitude, as I never saw one.

Helarctos malayanus (Raffles)

M.C.Z. No. 35890 1 juv. Siam, Mt. Angka. Alt. 4300 ft.

This bear cub named "Cinder" was brought in by natives and made a most entertaining pet, constantly sparring with two young macaques. He strangled himself with his own chain one night.

Cuon javanicus infuscus Pocock

M.C.Z. No. 35919 1 F. Siam, Mt. Nangkeo (Souket).
No. 35929 1 M. Siam, Mt. Angka. Alt. 4300 ft.

The female was shot by Lucas, one of our collectors, while chasing a sambur. The male killed by a native, weighed 25 pounds. The Karens used the urine and gall bladder for medicine.

Mustela nudipes Desmarest

M.C.Z. No. 36577 ? North Borneo, Mt. Kinabalu.
No. 36719 1 M. Borneo, Kalabakang R.
No. 36747 1 M. Borneo, Sarawak, Kuching.

One skin was bought from a native who said he killed it in his chicken house. 3000 ft., Kiau.

Charronia flavigula (Boddaert)

M.C.Z. No. 37008, 35457 2 F. Siam, Chieng Dao.
35895 1 F. Siam, Mt. Angka. Alt. 4300 ft.

Charronia flavigula henricii (Westerman)

M.C.Z. No. 36817 1 F. Borneo, Sarawak.

Nesictis everetti (Thomas)

M.C.Z. No. 36109–115, 36117–121 3 M., 9 F. North Borneo, Mt. Kinabalu.

(Griswold) This ferret-badger is a purely primeval-forest dweller and occurs from 3500 ft. to 9800 ft., but is not very common. I once

saw one at Paka Cave in the early morning; it did not move very fast but moved like a weasel in and out of the shrubbery; lost for one minute only to appear for a minute running along to some log and then into some thicket. They are quite tenacious of life.

Arctonyx collaris F. Cuvier

M.C.Z. No. 35894, 35932 2 F. Siam, Mt. Angka. Alt. 4000–4300 ft.

Micraonyx cinerus (Illiger)

M.C.Z. No. 36766 1 F. Borneo, Sarawak.
No. 36627 1 F. North Borneo, Talibang near Tuaran.
No. 36726 1 F. North Borneo, Kalabakang R.

Viverra zibetha Linnaeus

M.C.Z. No. 35880 1 F. Siam, Doi Souket. Altitude 1560 feet.
No. 35916 1 M. Siam, Mt. Angka. Altitude 4000 feet.

Shot at night with headlight; was feeding on the vulture bait near camp.

Viverra tangalunga Gray

M.C.Z. No. 36976 1 M. North Borneo, Abai.

Viverricula malaccensis (Gmelin)

M.C.Z. No. 35888–9 1 M., 1 F. Siam, Mt. Angka. Altitude 4300 feet.

Prionodon gracilis (Desmarest)

M.C.Z. No. 36576 1 F. North Borneo, Mt. Kinabalu.

Caught at night in Dusun trap at 6000 ft. Banks records it on Kinabalu from about 3000 ft.

Arctogalidia leucotis (Horsfield)

M.C.Z. No. 35899, 35915, 35927 2 M., 1 F. Siam, Mt. Angka. Altitude 4300 feet.

M.C.Z. No. 36819 1 M. Borneo, Sarawak, Kuching.

ARCTOGALIDIA STIGMATICA (Temminck)

M.C.Z. No. 36770 1 F. N. Borneo, Mt. Kinabalu.

Weight 4½ lbs. Caught in Dusun trap.

PARADOXURUS HERMAPHRODITUS LAOTUM Gyldenstolpe

M.C.Z. No. 35873, 35891 Siam, Mt. Angka. Altitude 4300 feet.

PARADOXURUS HERMAPHRODITUS SABANUS Thomas

M.C.Z. No. 36724 1 F. North Borneo, Sandakan.

PAGUMA LARVATA LEUCOCEPHALA Gray

M.C.Z. No. 36767, 36769 2 M. North Borneo, Mt. Kinabalu. Altitude 3300 feet.

Caught in Dusun traps.

ARCTICTIS PAJELI Schwarz

M.C.Z. No. 36974 1 M. North Borneo, Abai.

HERPESTES BRACHYURUS RAJAH Thomas

M.C.Z. No. 36725 1 M. North Borneo, Kalabakang R.
No. 36805 1 F. Borneo, Sarawak.

FELIS BENGALENSIS BENGALENSIS Kerr

M.C.Z. No. 35784 1 juv. Siam, vicinity of Chiengmai. Altitude 1100 feet.
No. 35892 Siam, Mt. Angka. Altitude 4300 feet.

Brought in by Meo of nearby native village.

FELIS BENGALENSIS UNDATA Desmarest

M.C.Z. No. 36768 1 M. North Borneo, Mt. Kinabalu. Altitude 4700 feet.
No. 36821 1 M. Borneo, Sarawak, Kuching.

Trapped in Dusun trap.

Felis nebulosa Griffith

M.C.Z. No. 35930 1 M. Siam, Chiengmai.

Brought in freshly killed by natives to our house in Chiengmai from vicinity of Chieng Dao, killed near house where it had been raiding chickens.

Felis pardus fusca F. A. A. Meyer

M.C.Z. No. 35867–8 2 juv. Siam, Mt. Angka. Altitude 4300 feet.

Taken by natives from a leopard's den and kept in camp as pets.

Felis pardus delacouri Pocock

M.C.Z. No. 36629 Indo-China, S. Annam, Ban Me Thouet.

A skin and skull collected by Andrew Wylie are referred to this race of which the specimen is nearly topotypical.

Manis pentadactyla dalmani Sundevall

M.C.Z. No. 35947, 35957 Siam, Mt. Angka. Altitude 4300 feet.

Tip of tail with scales in two rows.

Paramanis javanica (Desmarest)

M.C.Z. No. 35720 North Borneo, Mt. Kinabalu. Altitude 4300 feet.
No. 35926 Siam, Chiengmai.

Tips of tails white.

Lepus siamensis Bonhote

M.C.Z. No. 35864–6, 35870, 35872 3 F., 2 juv. Siam, Mt. Angka. Altitude 4300 feet.

The type locality is Chiengmai. One specimen was caught barehanded by a native, while it was dazzled at night by a flashlight. The weight of one female was 3 pounds.

Pteromys everetti Thomas

M.C.Z. No. 36378 1 M. North Borneo, Mt. Kinabalu. Altitude 5500 feet.

(Griswold) Heard almost every night at Lumu Lumu, and undoubtedly common, but terribly difficult to shoot and harder still to find in the thick underbrush.

PETAURISTA LYLEI Bonhote

M.C.Z. No. 35459–60, 35466 1 M., 2 F. Siam, Mt. Angka. Altitude 1500–4300 feet.

M.C.Z. No. 35466 1 M. Siam, Chieng Dao.

PETAURISTA ANNAMENSIS Thomas

M.C.Z. No. 36628 M. Indo-China, southern Annam, Ban Me Thouet.

PETAURISTA PUNCTATUS BANKSI Chasen

M.C.Z. No. 36579–36580 1 M., 1 F. North Borneo, Mt. Kinabalu. Altitude 5500 feet. Topotypes.

(Griswold) The type of *Petaurista p. banksi* Chasen was female; collected at Lumu Lumu on 12 Nov. 1933, by a botanist who killed it with a stone. Both my specimens were gotten at Lumu Lumu, one at night (see account in my paper), the other in the early morning. Neither was more than 75 ft. from my camp. I also saw one other glide across the clearing of an evening. These two flying squirrels are the second and third specimens ever to be collected. The type has no skull or measurements.

PTEROMYS PHAYREI LAOTUM (Thomas)

M.C.Z. 35779–83 3 M., 1 F., 1 ? Siam, Chiengmai. Altitude 1000 ft.

Five specimens from Chiengmai agree with Thomas's description of this race from northern Siam and the Laos Mountains. The dorsal coloring varies from 'orange cinnamon' to 'pinkish cinnamon', with which the hairs of the back are broadly tipped. At the sides these brown tips pale to gray. The bases of the hairs are dark, nearly 'slate gray', becoming blackish at the edge of the membrane.

In contrast with these from the lower country is a series of four skins from the montane forest at some four thousand feet or more on Mt. Angka, collected a few days later (in the last of February). This lot is uniformly different in color, lacking the bright brownish tint, and has noticeably smaller ear bullae. It evidently represents a more saturate highland race which may be called

PTEROMYS PHAYREI ANCHISES subsp. nov.

Type. Adult male, skin and skull 35776, Museum of Comparative Zoology, from Mt. Angka, northern Siam, 4300 feet altitude; collected February 27, 1937, by the Asiatic Primate Expedition.

Description. General tone of the dorsal surface, including forehead, crown, nape and back about pale 'wood brown', lacking altogether the more or less ruddy tint of the Chiengmai series referred to *P.p. laotum.* The hair pattern as seen when the fur is parted, shows the basal two-thirds of the hairs a 'deep neutral gray', then a short ring of blackish brown, succeeded by a short tip of pale buff, near 'pinkish buff' of Ridgway. On the flanks, the blackish subterminal ring becomes broader and the pale tips paler and shorter, until at the margin of the lateral membrane the blackish predominates and the pale tips give a mere hoariness. A narrow black ring surrounds the eye, from which there extends to and below the ear a pale grayish area, with gray-based hairs, which is continued up behind the ear as a narrow stripe, forming a half-collar of lighter. The sides of the face below the eye are pure white to the roots of the hairs, as are also the chin, chest, inner side of the fore legs and a narrow median area extending back nearly to the root of the tail and lower side of the femora. The rest of the ventral side of thorax and hind legs is white with gray bases to the hairs, and there may be a faint suffusion of pale 'straw yellow', possibly the result of staining. The toes and the inner margins of the feet are white; but the metapodial area is dusky. The extreme base of the tail is pale at the sides and more extensively so below, becoming 'warm buff' at the edges. Elsewhere the tail is blackish, with dull white showing through, and shades to a black tip and edges terminally; ventrally the central portion is soiled whitish. Ears nearly naked on the inner surfaces and sparsely clad with short scattered black hairs exteriorly.

Measurements. The type measured in the flesh: head and body, 178 mm.; tail, 143; hind foot with claws, 37; ear 22. The skull measurements are practically as in the race *laotum,* except for the size of the audital bullae, which in this mountain race are uniformly about one fifth smaller in antero-posterior extent. The skull of the type gives the following: greatest length, 42.5 mm.; basal length, 35.4; palatal length, 21.3; zygomatic width, 26.8; mastoid width, 19.5; width across molars, 11.0; upper cheek teeth, 9.5; lower cheek teeth, 8.7; antero-posterior length of bulla from front to junction with mastoid, 8.0 (in the series of *laotum* this measurement is 9.5).

The series of these flying squirrels (M.C.Z. No. 35775–8, 3 M., 1 F.) from the upper slopes of Mt. Angka is so different from the Chiengmai series in its lack of ruddy tints that it was remarked at once; the two series were taken at the same season of year (end of February) so that the difference can hardly be one of fading to any extent, while the obviously greater size of the audital bullae in the lowland animal makes

it apparent that the two are distinct, the new race perhaps confined to the upper forested levels of the mountains.

Reithrosciurus macrotis Gray

M.C.Z. 35660 North Borneo, Kalabakang R.

A specimen of this remarkable squirrel secured by H. G. Deignan was the only one obtained by the expedition.

Ratufa gigantea stigmosa Thomas

M.C.Z. No. 35874–6 1 M., 2 F. Siam, Mt. Angka. Altitude 4000–4600 feet.
No. 35877 1 F. Siam, Chieng Dao.
No. 35878–9 1 M., 1 F. Siam, Mt. Nangkeo (Souket).

Shot one lying out full length on a high branch with legs hanging down on either side. Weight of one male was 4 pounds (Griswold).

Ratufa affinis sandakanensis Bonhote

M.C.Z. No. 36581, 36587 2 F. North Borneo, Mt. Kinabalu. Altitude 4000 feet.

(Griswold) Two females of this giant squirrel were shot weighing 3 and 3½ lbs. respectively. It occurs in old forest around 4000 ft. but certainly not much above that altitude and is uncommon on Kinabalu. It is quite slow, for a squirrel, and makes a clucking noise that can be heard at some distance.

Ratufa ephippium (Müller)

M.C.Z. No. 36760–1 1 M., 1 F. Borneo, Sarawak.

Callosciurus baluensis baluensis (Bonhote)

M.C.Z. No. 36122–27 3 M., 3 F. North Borneo, Mt. Kinabalu.

(Griswold) All shot at Lumu Lumu, 5500 ft. Quite active in the trees, where it frequents the lower branches. Quite common and seems to be confined to mountain at an altitude of 6000 ft. or thereabouts.

Though regarded by Robinson and Kloss, in their list of Oriental squirrels (1918) as a race of *Callosciurus prevosti*, it seems quite possible that this may as well be treated as a distinct species, characteristic of the highland fauna of Borneo above three thousand feet. In a recent

paper Banks (1933) has indicated that it is present in the montane forests of Mt. Kinabalu, Mt. Murud, and Mt. Dulit, that is the upper parts of the north-central mountain chain, but is absent from the isolated peaks of Mt. Penrissen and Mt. Poi, farther to the southwest. Some years since, the Museum of Comparative Zoölogy received from E. Mjöberg a series of four squirrels taken on Mt. Tibang in the central part of the island, on the border of Dutch Borneo, a region included by Banks in the area above three thousand feet where the highland fauna occurs. These squirrels were tentatively identified as *C. baluensis*, but now with topotypes of that species for comparison, it is clear that the Mt. Tibang series represents a well-defined race which we propose to call

CALLOSCIURUS BALUENSIS MEDIALIS subsp. nov.

Type. Adult female, skin and skull 22265, Museum of Comparative Zoölogy, from Mt. Tibang, (central) Dutch Borneo; collected in 1925 by E. Mjöberg.

Diagnosis. Like *C. baluensis* but at once distinguished by having a prominent black line down the middle of the ventral side, feet without areas of clear orange rufous but uniformly ticked like the back and limbs, tail not clear black but its long hairs in part tipped with rufous and at their bases ringed with ochraceous.

Description. Upper lips, chin and upper part of rostrum nearly to the eyes clear 'orange rufous', merging at the forehead into the finely ticked black and ochraceous of the entire dorsal surface of body, limbs and feet. On close inspection the pattern here is seen to be the result of a mixture of longer stouter hairs of shining black with a narrow subterminal ring of 'orange rufous', and abundant shorter, slightly crinkly hairs having gray bases and minute tips of 'light orange ochraceous', that is, yellower and less red than the bands on the longer hairs. The general appearance of the dorsal surfaces is thus a minutely ticked black and rufous. Inside of ears very slightly more rufous, their backs a little clearer black than the crown. Eye-ring 'orange rufous', cheeks mixed black and 'light orange ochraceous'. At the sides a narrow whitish to pale buffy stripe, 4–5 mm. wide extends from axilla to groin; immediately ventral to this and practically coextensive with it is a broader stripe, about 17 mm. wide of intense black, while in the mid-ventral line another narrower stripe of black, some 4–5 mm. wide, runs from the lower throat to the abdomen, not quite equalling the lateral black lines in posterior extension. The remainder of the under surface including chin, throat, and under side of arms back between the

black stripes to the base of the tail and on the inside of the hind legs to the ankles and the inner border of the heel, is clear 'orange rufous'.

The tail appears shining black both above and below with scattered minute 'orange rufous' tips to some of the hairs, but on parting these long hairs it is seen that their long black ends partly conceal two or three short rings of lighter 'orange ochraceous'.

Measurements. No flesh measurements accompany any of the specimens but the hind foot of the type measures 58 mm., with claws.

The skull of the type measures: greatest length, 52.6 mm.; basal length, 47.3; palatal length, 27.0; zygomatic width, 33.3; width across molars, 12.3; upper cheek teeth, 9.1; lower cheek teeth, 9.3.

This race of the central highlands of Borneo differs strikingly from typical *baluensis* of Mt. Kinabalu, in the strong development of the narrow black line in the center of the red belly, whereas in the latter this line is absent or represented by a few scattered black hairs in the center of the abdomen. In all those of the typical race the feet are bright ochraceous, whereas in the Mt. Tibang series they are not brighter than the back while even more striking is the completely black tail of the former and the slightly variegated tail of the latter. This is doubtless a montane form confined to the highland forest of central Borneo.

Callosciurus erythraeus zimmeensis (Robinson & Wroughton)

M.C.Z. No. 35354–8 8 M., 6 F. Siam, Mt. Angka. Alt. 4300 ft.
No. 35361–9.

This squirrel, although described as a race of *C. atrodorsalis*, should doubtless go in the *erythraeus* series, as Osgood has suggested. Of a series of fourteen from slightly over 4300 feet on Mt. Angka, five show a well-marked dorsal band of deep black from shoulders to base of tail; in five others the band is narrower and confined to the lower half of the back; while in the remaining four the band is hardly evident except as a slightly darkened median area where black predominates in the generally ticked pattern of the back. On the lower surface this mixed coloring extends to the chin and throat, and usually forms a median line dividing the red of the belly all the way from the chest to the base of the tail.

Callosciurus ferrugineus primus subsp. nov.

Type. Adult female, skin and skull 35352, Museum of Comparative Zoölogy, from Mae Wan River, near Mt. Souket, northern Siam,

1500 feet altitude; collected February 20, 1937, by the Asiatic Primate Expedition, J. Augustus Griswold, Jr.

Description. Upper side of head from just back of the nose pad, the cheeks, the forehead back to a line joining the anterior bases of the ears, and the entire dorsal side of the body from about the base of the neck on to the proximal inch or two of the tail, are the usual finely ticked mixture of black and 'warm buff', continuing, but slightly grayer on the upper sides of the legs and feet to the tips of the digits which are very slightly blacker. With a lens it is seen that the pelage consists of (a) shorter, finer hairs slaty at the base with 'warm buff' to 'ochraceous buff' subterminal rings and a minute black tip, and (b) longer, coarser hairs with two or three narrow rings of the same colors alternating with broader black rings and having a conspicuous black tip. The hairs of the crown of the head and nape have the paler rings much intensified in color with 'orange rufous', giving this region a decidedly ruddy tone, which gradually pales into the duller ticking of the shoulders. The ears on both surfaces are conspicuously 'bright orange rufous' with a few all-black hairs on the rims. The color of the back extends to about the basal third of the tail above, beyond which for a short distance the black rings of the hairs produce four or five distinct transverse bands, while the terminal half of the tail is a conspicuous uniform rich 'ferruginous'. Ventrally, the middle third of the tail shows the alternating black and 'pale ochraceous' bands in the medial area, with the lateral fringe and the tip ferruginous.

The entire ventral side of the body from chin to anus, and the legs to the wrists and ankles is a nearly uniform chestnut red, nearest bright 'tawny' of Ridgway, the chin itself duller, about 'ochraceous orange'. Both specimens, the type and a second skin from the same locality, agree closely except that the latter is slightly more suffused with orange rufous on the nape and shoulders. Mammae four, inguinal, as characteristic of the genus.

Skull. The skull agrees with others of the *ferrugineus* series of squirrels in its larger size and proportionally broader interorbital space as compared with that of the *erythraeus* group. The small spicular upper premolar is situated full in the tooth row at the middle point of the large premolar.

Measurements. No flesh measurements of the type were taken but the paratype, a male, M.C.Z. No. 35353, from Doi Souket, measured: total length, 433 mm.; tail, 216; hind foot, 52.5; ear, 15; the hind foot of the type measures 53.7 mm. in the skin. The skull of the type measures: greatest length, 54.8 mm.; basal length, 47.5; palatal

length, 27.0; zygomatic width, 33.2; mastoid width, 23.8; width across molars, 13.0; interorbital width, 19.5; upper tooth row, 10.5; lower tooth row, 10.8; jaw from condyle to upper base of incisor, 32.5.

These two squirrels from Mt. Souket are remarkably interesting in that they apparently represent not only the most northern form of the *ferrugineus* series, but also the nearest approach to what must have been the primitive color pattern of the group in which the upper surface still shows the minutely ticked, 'pepper-and-salt' mixture of black and ochraceus, while erythrism, which in the southern forms extends to practically the entire pelage, is here but just beginning to appear dorsally in the ruddy tint of the crown and nape, the rufous ears and the chestnut of the terminal half of the tail. The under side of the body and limbs is completely 'red' (bright tawny), even to the chin and throat, which in most of the *erythraeus* series are instead of the same mixture as the back, and this often continued as a median ventral stripe to the base of the tail. The description of *C. erythraeus pranis* reads much like that of the new form, but this race of southern Siam, of which specimens have been examined is obviously a small member of the *erythraeus* series, and shows a much less amount of red in the tail and a mixed ochraceous-and-dark throat. In southern and eastern Siam and French Indo-China, the species is almost completely erythristic, with in occasional specimens, a slight hint of an originally speckled area on cheeks or arms.

Callosciurus vittatus dulitensis (Bonhote)

M.C.Z. No. 36799, 36754 Borneo, Sarawak, Baram.
No. 36704 1 F. North Borneo, Morutai Besar.
No. 36705, 36706 2 F. North Borneo, Abai.
No. 36254–58, 36328–77 29 M., 26 F. North Borneo, Mt. Kinabalu. Altitude 2000–5500 ft.

(Griswold) All those from Mt. Kinabalu were taken around Kiau at an altitude of about 3000 ft. It frequents the second growth and is abundant.

Callosciurus prevostii banksi (Chasen)

M.C.Z. No. 36800 1 F. Borneo, Sarawak.

Callosciurus prevostii caroli (Bonhote)

M.C.Z. No. 36781 1 F. Borneo, Sarawak.

Callosciurus prevostii griseicauda (Bonhote)

M.C.Z. No. 36780 1 F. Borneo, Sarawak.

Callosciurus prevostii kuchingensis (Bonhote)

M.C.Z. No. 36779 1 M. Borneo, Sarawak.

Callosciurus prevostii pluto (Gray)

M.C.Z. No. 36716 1 M. North Borneo, Abai.

Tomeutes hippurus grayi (Bonhote)

M.C.Z. No. 36758 1 M. Borneo, Sarawak, Baram.

Tomeutes hippurus hippurellus (Lyon)

M.C.Z. No. 36759 1 M. Borneo, Sarawak, Kuching.

Tomeutes hippurus pryeri (Thomas)

M.C.Z. No. 36717–8 1 M., 1 F. North Borneo, Kalabakang R.

Tomeutes jentinki (Thomas)

M.C.Z. No. 36291–311 7 M., 13 F. North Borneo, Mt. Kinabalu.

(Griswold) This small squirrel is found on the mountain from 3300 ft. to 7000 ft. It was common around Lumu Lumu. Although very active it was silent, always in the trees rather than on the ground.

Tomeutes lowii (Thomas)

M.C.Z. No. 36403 1 M. North Borneo, Mt. Kinabalu. Altitude 3500 feet.
M.C.Z. No. 36715 1 M. North Borneo, Kalabakang R.

(Griswold) Undoubtedly a lowland species.

Tomeutes tenuis parvus (Miller)

M.C.Z. No. 36749 Borneo, Sarawak, Mt. Dulit.
No. 36756 1 M. Borneo, Sarawak, Mt. Penrissen.

Dremomys rufigenis ornatus (Thomas)

M.C.Z. No. 35334–47, 35832–3 8 M., 8 F. Siam, Mt. Angka. Altitude 4300 feet.

No. 35348–51 2 M., 2 F. Siam, Mt. Nangkeo.

Menetes berdmorei consularis Thomas

M.C.Z. No. 35370–5 2 M., 4 F. Siam, Mt. Angka. Altitude 4300 feet.

No. 35376–7 1 M., 1 F. Siam, Mt. Nangkeo (Souket).

Rhinosciurus everetti (Thomas)

M.C.Z. No. 36146, 36225–252, 36475 17 M., 13 F. North Borneo, Mt. Kinabalu.

(Griswold) One of the commonest animals of the upper slope of Kinabalu along with *Rattus alticola* and *Tupaia baluensis* and *Rattus baluensis*. It ranges from 3500 ft. to 11,000 ft. At 11,000 ft. it is rare. Common from 3500 to 6000 ft. Found in the deep jungle or primary forest. I believe all were caught in Dusun traps.

Rhinosciurus laticaudatus (Müller & Schlegel)

M.C.Z. No. 36753 1 M. Borneo, Sarawak, Kuching.

Tamiops macclellandi kongensis (Thomas)

M.C.Z. No. 35845–8, 35853–4 3 M., 3 F. Siam, Mt. Angka. Altitude 1450 to 4300 feet.

No. 35849, 35851–2 2 M., 1 F. Siam, Chiengmai.

No. 35850 1 F. Siam, Mae Wan R., Mt. Souket.

Nannosciurus whiteheadi Thomas

M.C.Z. No. 36311–19 4 M., 5 F. North Borneo, Mt. Kinabalu.

(Griswold) Ranges from 3000 ft. to around 6000 ft. Not very common. It frequents low trees and also runs around on the ground and in the underbrush. Although really very tame it will scurry away from you. I watched one for over two minutes that sat not more than 4 ft. from me.

Nannosciurus exilis sordidus Chasen & Kloss

M.C.Z. No. 36712–4 1 M., 2 F. North Borneo, Sandakan, Abai, Kalabakang R.

Nannosciurus exilis (Müller & Schlegel)

M.C.Z. No. 36755–6 1 M., 1 F. Borneo, Sarawak, Kuching.

Leggada booduga Gray

M.C.Z. No. 35855 1 F. Siam, Chiengmai.

Leggada pahari gairdneri Kloss

M.C.Z. No. 35774, 35785–6, 35798–808, 35843–4, 35905–6, 35912 7 M., 7 F., 3 juv., 2 ? Siam, Mt. Angka. Altitude 4300 feet.

Rattus alticola alticola (Thomas)

M.C.Z. No. 36450–476, 36506–513, 36516–519, 36522, 36528–530 28 M., 15 F. North Borneo, Mt. Kinabalu.

(Griswold) A spiny rat of the primary forest, which is now only found on the upper slopes of Kinabalu from 4000 to 8000 feet. This rat was the most common species and occurs as far up as 11,000 ft., but is comparatively rare at that altitude. All caught in Dusun traps or snares.

Rattus alticola ochraceiventer (Thomas)

M.C.Z. No. 36177–9 2 M., 1 F. North Borneo, Mt. Kinabalu. Altitude 3300 ft.

Rattus berdmorei (Blyth)

M.C.Z. No. 35385 1 F. Siam, Mt. Angka. Altitude 4300 feet.

Rattus concolor (Blyth)

M.C.Z. No. 35859–60, 35863 1 M., 2 F. Siam, Chiengmai.

Rattus concolor ephippium (Jentink)

M.C.Z. No. 36196–219, 36525–27, 36532 13 M., 15 F. North Borneo, Mt. Kinabalu.

(Griswold) Common around 3000 ft.; never found in virgin jungle. All specimens bought. Caught in native traps.

Rattus fulvescens (Gray)

M.C.Z. No. 35518–20, 35544 2 M., 1 F., 1 ? Siam, summit of Mt. Angka. Altitude 8070 feet.

M.C.Z. No. 35787, 35792–3, 35795–6, 35861 5 M., 1 F. Siam, Mt. Angka. Altitude 4300 feet.

M.C.Z. No. 35788 1 ? Siam, Mt. Nangkeo (Souket).

Rattus indosinicus Osgood

M.C.Z. No. 35521–31, 35546–51 8 M., 8 F., 1 juv. Siam, top of Mt. Angka. Altitude 8070 feet.

M.C.Z. No. 35857 1 M. Siam, Mt. Angka. Altitude 4300 feet.

Rattus infraluteus (Thomas)

M.C.Z. No. 36105–8 3 M., 1 F. North Borneo, Mt. Kinabalu. Topotypes.

(Griswold) This large black rat is comparatively rare. I caught specimens from 5000 ft. to 7000 ft. It seems more plentiful at 7000 ft. One specimen weighed 1¼ lbs. All trapped.

Rattus muelleri borneanus (Miller)

M.C.Z. No. 36765, 36802 2 F. Borneo, Sarawak.

Rattus rapit (Bonhote)

M.C.Z. No. 36195, 36479–80, 36483–89 7 M., 3 F. North Borneo, Mt. Kinabalu. Altitude 3080 to 11000 feet. Topotypes.

Rattus rattus baluensis (Thomas)

M.C.Z. No. 36491–505 6 M., 9 F. North Borneo, Mt. Kinabalu.

(Griswold) Only at higher altitudes; very plentiful, from 9 to 11,000 ft. This rat is quite tame, running over your face or eating your food if you sleep out on the ground.

Rattus rattus diardi (Jentink)

M.C.Z. No. 36764, 36804 2 M. Borneo, Sarawak.

Type from Java.

RATTUS RATTUS SLADENI (Anderson)

M.C.Z. No. 35858 1 M. Siam, Mt. Angka. Altitude 4300 feet.

RATTUS SABANUS (Thomas)

M.C.Z. No. 36290, 36490 1 M., 1 F. North Borneo, Mt. Kinabalu. Altitude 3300–7000 feet.

RATTUS SURIFER SURIFER (Miller)

M.C.Z. No. 35545 1 F. Siam, Doi Nangkeo (Souket). Altitude 4300 feet.

RATTUS SURIFER BANDAHARA (Robinson)

M.C.Z. No. 36482 1 F. North Borneo, Mt. Kinabalu.
No. 36763 1 M. Borneo, Sarawak.

Single specimen caught at Lumu Lumu the third day. Altitude 5500 feet.

RATTUS WHITEHEADI (Thomas)

M.C.Z. No. 36180–194, 36220–223 8 M., 11 F. North Borneo, Mt. Kinabalu.

Seems to occur from 3000 to 7000 feet.

CHIROMYSCUS CHIROPUS (Thomas)

M.C.Z. No. 35790 1 M. Siam, Mt. Nangkeo.
No. 35794 1 F. Siam, Mt. Angka. Altitude 4300 feet.

CHIROPODOMYS LEGATUS Thomas

M.C.Z. No. 36535–39 2 M., 3 F. North Borneo, Mt. Kinabalu. Altitude 3300–4900 ft.

All bought from Dusuns.

CHIROPODOMYS PUSILLUS Thomas

M.C.Z. No. 36540 1 M. North Borneo, Mt. Kinabalu.

Bought from Dusun at Kiau, 3080 feet.

EOTHENOMYS MELANOGASTER CONFINII Hinton

M.C.Z. No. 35532–4, 35537–43 7 M., 2 F., 1 juv. Siam, summit of Mt. Angka. Altitude 8070 feet.

Cannomys badius (Hodgson)

M.C.Z. No. 35769–72 3 M., 1 F. Siam, Mt. Angka. Altitude 4300 feet.

Rhizomys pruinosus senex Thomas

M.C.Z. No. 35935–36, 36036–37, 3 juv., 1 ? Indo-China, southern Annam, Ban Me Thouet.

Three of these specimens, collected by Andrew Wylie, are young, but all are tentatively referred to the subspecies *senex*.

Trichys lipura (Günther)

M.C.Z. No. 36776 1 F. Borneo, Kuching.

Sus cristatus jubatus Miller

M.C.Z. No. 37006. Skull, Indo-China, southern Annam, Ban Me Thouet.
No. 35925. 1 F. Siam, Mt. Angka. Altitude 4300 feet.

Type from Trong, Lower Siam.

This sow was wounded by our native hunter Kawa and charged him. We found three embryos in her and she weighed more than 250 lbs.

Tragulus kanchil affinis Gray

M.C.Z. No. 37004–05. Indo-China, southern Annam, Ban Me Thouet.

Two skins and skeletons were secured by Andrew Wylie and are presumably this race, typical in Cambodja.

Muntiacus muntjak curvostylis (Gray)

M.C.Z. No. 37002 1 M. Siam, Chieng Dao.
No. 35917–18, 35928 3 M. Siam, Mt. Angka. Altitude 4300 feet.

Two of these were shot night hunting. They weighed 53, 58, and 62 lbs.

Cervus porcinus annamiticus Heude

M.C.Z. No. 37003 F. Indo-China, southern Annam, Ban Me Thouet.

A skin and skeleton of a female were brought back by Andrew Wylie.

Rusa unicolor (?) equinus (Cuvier)

M.C.Z. No. 35923–4, 35926, 35964 1 M., 1 F., 1 juv. Siam, Mt. Angka. Altitude 4300 feet.

No. 36679 F. Indo-China, southern Annam, Ban Me Thouet.

These were shot night hunting close to camp, the female by Champee by moonlight. The adult male weighed 238 pounds.

Bibos gaurus readi Lydekker

M.C.Z. No. 36669–70, 36673, 36677–78, 36778. Indo-China, southern Annam, Ban Me Thouet.

A skeleton and several more or less incomplete skulls secured by Andrew Wylie.

Bibos banteng (Raffles) subsp?

M.C.Z. No. 36672, 36674, 36676, 36777. Indo-China, southern Annam, Ban Me Thouet.

Two skulls, two frontlets, and a skin and skeleton were secured by Andrew Wylie. The proper name for this animal is still somewhat in doubt. Père Heude in 1901 (Mém. concern. Hist. Nat. de l'Emp. Chin., vol. 5, pt. 1, pp. 3–9) bestowed a number of names upon the bantings of Indo-China, based on slight variations in skull characters. These antedate the names given by Lydekker, namely *Bos sondaicus butleri* (1905), type from Perak, and *Bos sondaicus porteri* (1909), type from Siam. Which of these names may be valid for the animal from Annam will require further study with adequate material. Osgood suggests that the first of Heude's names, *Gauribos laosiensis*, may be the valid one.

Novibos Sauveli (Urbain)

As supplementing the work of the Expedition, mention may here be included of a specimen of the recently discovered forest ox or Kouprey, secured for the Museum through the interest of Mr. J. C. Greenway, Jr., of M. Delacour's "VIIe Expédition en Indo-Chine". It was taken at Samrong, Cambodia, and consists of the tanned hide and much of the skeleton. An illustrated account of the history and characters of the species was published by Coolidge (Mem. Mus. Comp. Zool., vol. 54, pp. 419–531, 11 pls., 1940), who has made it the type of the new genus, *Novibos*.

BIRDS FROM NORTHERN SIAM

By James C. Greenway, Jr.

One thousand and sixty birds comprising eighty-seven forms were collected by J. A. Griswold, Jr. and native collectors at Chieng Mai, on Mt. Angka and Mt. Nangkao. This report is not a complete list of the collection, but the interesting species are noted. This region of northern Siam is peculiar in that mountains rise abruptly from the rice fields of the plains, constituting from the point of view of the mountain avifauna, a region of islands, the lowlands being as unsuited to most mountain birds as an ocean. Genera which are peculiar to these mountains are, as might be expected, distributed through the Himalayan region, east to western China and the mountains of Tonkin and Laos, and to the southward through Burma, Tenasserim and Malaya in suitable places.

These mountains are, geographically speaking, intermediate between the mountains of Tenasserim and those of Laos. Though a conclusive comparison of series of birds of Karrenni, Mt. Muleyit and other topotypical localities in Burma with those of northern Siam has not been possible, it appears that the subspecies are not characteristically intermediate but vary in an apparently fortuitous manner. This is illustrated well by the distribution of the forms of *Mesia argentauris* (*vide* Mayr and Greenway, Proc. New Engl. Zool. Club, **17**, 1938, pp. 1–7) and *Garrulax erythrocephalus* (*vide* Deignan, Proc. Biol. Soc. Wash., **51**, 1938, pp. 87–92). This type of variation which one associates with color varieties, by which is meant the vast majority of insular subspecies or races in birds, does not appear to be intimately connected with any process of evolution as at present understood, and though there can be no doubt that the characters are transmitted through the genotype, the processes of their transmission are not known. The only known prerequisite for this insular and discontinuous type of variation is isolation.

I thank very much H. G. Deignan and the officials of the U. S. National Museum, R. M. de Schauensee and the officials of the Academy of Natural Sciences of Philadelphia, and, most especially E. Mayr and the officials of the American Museum of Natural History of New York for the loan of material and their helpful assistance.

Corvus macrorhynchus macrorhynchus Wagler

1 ♀ Mt. Angka (4300 ft.) 26 Feb.

This specimen is intermediate between *macrorhynchus* and *andamanensis*. It is identical with the former in color but somewhat smaller. The wing measures 308 mm. and the culmen 59 mm. as against 315, 319, 338 (wings) and 57, 65, 63 (culmen) for Javanese specimens.

The name *macrorhynchus* is of course older than *levaillanti* (*vide* Baker, Faun. Brit. Ind., Birds, **8**, p. 593).

I regard *mengtszensis* La Touche as a synonym.

Crypsirina temia (Daudin)

1 ♂ Chieng Mai, 17 Feb.

C. t. longipennis Neumann (Bull. B.O.C. **55**, 1935, p. 135) has been synonymized by Chasen (Bull. Raffles Mus., Singapore, **11**, 1935, p. 309, footnote) who says that the measurements of Siamese and Javanese birds overlap (112–120 mm. for Siamese birds, against 113–119 mm. for Javanese birds).

Measurements of series at hand are as follows: Burma (females) 125,118 mm; Siam (male) 116.5; Cochin China 114.5; Java (male) 116, 112.5, (female) 110.5, 112.

Paradoxornis gularis transfluvialis (Hartert)

4 ♂ 2 ♀ Mt. Angka (4300 ft.) 1–15 March

Three races may be recognized solely on the basis of size. I can find no other constant differences.

Measurements:

P.g. fokiensis (David)

Males		Females	
Wing	Tail	Wing	Tail
91–100	80–91	90–91	76–83

P.g. gularis (Gray)

Sex ?			
90–92	75–79		

P.g. transfluvialis (Hartert)

86–92	77–82	82–87	75–79

Material examined: *P.g. fokiensis* 7♂ 5♀ from Kuatun and the Yenping Mts., Fokien, in the Museum of Comparative Zoölogy.

P.g. gularis 7 ? "Sikkim" in the Rothschild Collection and the Museum of Comparative Zoölogy.

P.g. transfluvialis 4 ♂ 2 ♀ from Guilang, Cachar, in the Rothschild Collection; 6 ♂ 4 ♀ from Mt. Angka and Chieng Mai, northern Siam.

Garrulax erythrocephalus melanostigma Blyth

7 ♂ 5 ♀ Mt. Angka (7600 to 8100 ft.) 23, 24, 26, 27, 28, 30 March
6 ♂ 1 ♀ Mt. Angka (4300 & 5700 ft.) 5, 15, 17, 18, 19 March

Deignan records these specimens as *G. e. melanostigma* > *schistaceus*, *schistaceus* being the race of Doi Chieng Dao and northern Siam which he describes.[1] This would appear to be another excellent example of the virtually insular character which the geographical variations of some of the birds of this region demonstrate.

Specimens taken above 6,000 ft. have rather longer and stouter bills, (26–28 mm. as against 24–25 mm.) and as a rule, have less brown on the throat and upper breast than those from lower altitudes. There are no other differences that I can discover, however, and I do not consider that those mentioned above are of sufficient importance to merit formal description.

Myiophoneus caeruleus caeruleus (Scopoli)

2 ♂ 2 ♀ Mt. Angka (4300 ft.) 6, 7, 8, 15 March

These specimens have black bills and are otherwise indistinguishable from a series from Fukien, China, which is typical *caeruleus*. H. G. Deignan, who has described *M. c. rileyi*, a yellow billed form, as the breeding bird of Mt. Angka (Proc. Biol. Soc. Wash., **51**, 1928, p. 25) writes me that the black billed form is "definitely only a migrant in Siam, present from October to March."

Pomatorhinus schisticeps nuchalis Tweeddale

5 ♂ 1 ♀ Mt. Angka (4300 ft.), 27 Feb., 9 March, 13 March
2 ♀ Mt. Nangkao (2800 ft.) 12 April

The specimens from Mt. Angka agree perfectly with a specimen of *nuchalis* from Maymayo in southeastern Burma. They are smaller than *olivaceus* (wing 86–90) and they have olivaceous rather than grey heads, which seems to me to be a much better character to distinguish *schisticeps* from *nuchalis* than streaks on the sides.

[1] Proc. Biol. Soc. Wash., **51**, 1938, p. 90.

The two females from Mt. Nangkao differ from the Mt. Angka series in being somewhat browner on the back and in having less rufous at the back of the neck. Since there is one bird in the Mt. Angka series which also has a small bill and less rufous at the back of the neck, I suspect that these characters might disappear in the range of individual variation if a larger series were at hand.

Though it may yet be necessary to revise our opinions, it would appear safe enough at present to consider *nuchalis* and *olivaceus* as subspecies of *schisticeps* as de Schauensee has done.[1]

Stachyris nigriceps yunnanensis La Touche

3 ♂ 1 ♀ Mt. Angka (4300 ft.) 6, 8, 17 March
1 ♂ Mt. Nangkao (2800 ft.) 16 April

Examination of large series in the American Museum of Natural History proves this population to be identical with that of northern Tonkin, and though somewhat paler below than *yunnanensis*, thus showing an approach to *davisoni*, it is referable to *yunnanensis*. These populations have very black heads, unlike *davisoni*, which has the head somewhat more brownish olive, as has typical *nigriceps* and *coltarti* of upper Assam. The last differs from all other forms in having a darker throat and a clearer brown upper breast.

The post mortem change is very striking in this group, old skins, as usual, becoming browner and less olivaceous. The three specimens from Tenasserim, for example, are browner above and below than the series from Siam and Tonkin. The former, however, are older skins (1924) and it seems very probable that they have foxed.

coltarti

Margherita, Assam

Wing ♂	Tail	Wing ♀	Tail
59	48	61	51 (Type)
59	50		

Laising and Hungunn, N. Cachar

58	51	57	49

davisoni

Taok Plateau, Tenasserim

60	55
59	51
58	52 (sex?)

[1] Proc. Acad. Nat. Sci. Philad., 86, 1934, p. 185

Mt. Tahan, Pahang, Malaya

60	50	60	49
61	51	59	47.5
62	53	57	48
63	53	60	48
63	50		

yunnanensis

Hokow & Loukouchai, E. Yunnan

Wing ♂	Tail	Wing ♀	Tail
59	51 (Type) M.C.Z.		
61	53		

Chapa, Tonkin

62	56	62	52
63	55 sex ?		
60	54 " "		
63	56 " "		
60	53 " "		

Hoi Xuan & Lung-Lunh, Annam

63	55
60	55
61	54
59	51 sex?

Mt. Angka, Siam

60	56
60	56
62	55
62	53

MIXORNIS GULARIS SULPHUREA (Rippon)

3 ♂ 1 ♀ (juv.) Mt. Nangkao (2800 ft.) 8, 10, 13, 15 April

Kloss (Ibis, 1918, p. 206) and de Schauensee have shown (Proc. Acad. Nat. Sci. Phila., 86, 1934, p. 192) that Gyldenstolpe's *minor* does not differ from the bird of the southern Shan States, and that the northern Siamese bird must, therefore, be called *sulphurea*.

The bird of southern Yunnan is indistinguishable from *M. g. lutescens* Delacour and Jabouille. This form is much more richly colored (particularly above) than *sulphurea*.

Specimens examined: 2 males 2 females, Hokow, Yunnan, 15, 22, 27 March, 1 April; 1 male 1 female, Muong Moun, Tonkin, 28 March, 7 April; 1 male 1 female, Koon Tan, N. Siam, as well as the series from Mt. Angka.

Alcippe fratercula fratercula Rippon

4 ♂ 2 ♀ Mt. Angka (4300 ft.) 4, 11, 12, 13, 24, 30 March
4 ♂ Mt. Nangkao (2800 ft.) 15, 18, 21 April

These specimens agree perfectly with series from Tenasserim in the Rothschild collection. I have followed Ticehurst (Ibis, 1935) in considering *fratercula* to be a distinct species, at least for the time being.

Wing	Tail	Bill	Wing	Tail	Bill
		Mt. Nangkao, Siam			
63	60				
62	60	15			
61	59	15			
62	61	15			
61	61	15			
		Mt. Angka, Siam			
60	60	15	63	61	16
65	61	15	64	61	15
65	63				
		Phong Saly, Laos			
60	54(worn)	15	62	61	14

Alcippe poiocephala haringtoniae Hartert

1 ♂ 1 ♀ Chieng Dao, 23 Feb.
6 ♂ 3 ♀ Mt. Nangkao, 9, 13, 15, 16, 20, 23 April

This series agrees perfectly with series from Tonkin and also with the type series of *haringtoniae* Hartert, which has been examined in the American Museum of Natural History in New York. We are, therefore, left with no choice but to call this population *haringtoniae* in spite of the fact that Ticehurst (Ibis, 1935, p. 51, 52) has found that topotypical populations contain intermediates. *Alcippe poiocephala alearis* Bangs and Van Tyne must be relegated to synonomy.

There is not enough material at hand to make conclusive comparisons with the other races, *davisoni*, *phayrei*, *karrenni* and *fusca*. Three

specimens[1] of *karrenni*, however, differ from *haringtoniae* in having the coronal stripes less clearly marked and in being somewhat browner on flanks and rump.

Chieng Dao (1280 ft.) and Mt. Nangkao, Siam

Wing	Tail	Bill	Wing	Tail	Bill
69	70	16	66	69	
69	68	16	67	67	15
67	68	16	67	68	15
70	70	16	66	67	16
69	67	16			
68	69	16			

Pseudominla castaneiceps exsul (Delacour)

11 ♂ 5 ♀ Mt. Angka (8100 ft.) 17, 22, 24, 25, 28 March

Comparison with a large series of Indian birds in the Rothschild collection shows that, as usual in the Timaliidae, post mortem change has taken place, and that the older series are almost useless for subspecific identification. The situation is further complicated by the fact that very dark and very light males were collected on December 5, 1928 by Dr. Hugh M. Smith on Mt. Angka (8000 ft.). These facts make the recognition of Delacour's *exsul* difficult.

Siva strigula castaneicauda Hume

13 ♂ 12 ♀ 1 juv. Mt. Angka (8100 ft.) 22–31 March

As usual these birds are subject to post mortem change. Birds in worn plumage are much grayer than those in fresh plumage. It is clear, however, that birds of Yunnan and northern Tonkin have yellow ear coverts while those of the Chin Hills, northern Siam and Malaya 1 are grayish (much lighter in Burma than in Malaya). There is no material from Tenasserim available. Siamese and Tonkinese birds are somewhat more richly colored below than are *yunnanensis* and *castaneicauda*, but since the skins of the latter are much older it may be that the difference is due to post mortem change.

1 *s.c. malayana* Hartert.

[1] 1 Vin Pang (28 miles east of), Siam, Jan. 30, 1924, A. S. Vernay coll. (wing 70, tail 64)
1 Binhon, Thayet, Burma, Jan. 21, 1912, (wing 67.5, tail 63)
1 Maplay chong, Thaungyme, Tenasserim, Feb. 8, 1880, H. H. Harington coll. This specimen very worn and "foxed".

CUTIA NIPALENSIS NIPALENSIS Hodgson

1 ♂ 1 ♀ Mt. Angka (7400 ft.) 31 March

These specimens do not differ from Indian birds.

MESIA ARGENTAURIS GALBANA Mayr & Greenway

4 ♂ 3 ♀ Mt. Angka (4300–5700 ft.) 3, 5, 11, 13, 18 March

This well marked form was described in the Proc. N. E. Zool. Club, **17**, 1938, p. 3 (q.v.) as being somewhat greener on the back and in having considerably paler and more yellowish nuchal collar and underparts than other forms.

AETHORHYNCHUS LAFRESNAYANUS INNOTATUS (Blyth)

2 ♂ Mt. Nangkao (2800 ft.) 15, 20 April

These specimens have green tails and the outer webs of the primaries narrowly edged with green; the secondaries are almost entirely green. The ear coverts are tinged strongly with yellowish and the forehead of one is tinged with yellowish. The rump and upper tail coverts are green like the back. Both have very large and stout bills. In comparison with a single specimen from Darjeeling they are lighter, clearer green above and lighter, brighter yellow below. There is no yellow ring around the eye.

Measurements

Wing	Tail	Bill
	Siam	
73	59	25
73	60	25
	Nepal	
69	56	22

A large series of breeding specimens is needed to distinguish these two races (Stuart Baker Faun. Brit. Ind. **8**, p. 610).

CHLOROPSIS HARDWICKII HARDWICKII Jardine & Selby

3 ♂ ad. 1 ♂ imm. 4 ♀ Mt. Nangkao (2800 ft.) 9, 10, 11, 12 April
2 ♂ Mt. Angka (4300 ft.) 3, 5 March

In view of the fact that wing measurements of males of this series average 93 mm. and females 87 mm., I am left with no choice but to

refer the birds to the nominate form. de Schauensee (1934, p. 200) has found that the birds in the vicinity of Chieng Mai are somewhat smaller (88.5 for males and 84.66 for females) and he refers them to *malayana*. *C. h. malayana* was described by Robinson and Kloss from Gunong Ijau, Perak, 4500 ft., so that it is not possible that the distribution is altitudinal.

A single specimen from Nepal is somewhat yellower, less green above, but does not differ in other respects from the series at hand. Its wing measures 94 mm.

Wings of males measure 95, 94, 90, 93, and females 87, 86.5, 86.5, 88 mm.

Criniger tephrogenys henrici Oustalet

1 ♂ 2 ♀ Mt. Angka (4300 ft.) 2, 14, 19 March
1 ♂ 1 ♀ Mt. Nangkao (2800 ft.) 12, 14 April
1 ♂ Mae Wan River near Doi Saket, 21 Feb.
1 ♂ Chiengmai, 23 Feb.

These specimens show variation from tawny brown to greenish gray with a slight yellow wash which almost bridges the difference between the two species *tephrogenys* and *gutturalis*.

Wings of males measure 108.5–112 and of females 105–108. Five specimens from Loukouchai in southern Yunnan measure 103–106 (males) and 104 (single female). Delacour (Ois. Indo-Chine F., p. 30, 31) gives measurements of 102–118 for males from northern Tonkin and 102–112 for males of his race *annamensis* of Annam and Cambodia, from which I think we may conclude that there is no great difference between the two races.

Collin and Hartert (Novit. Zool., 1927, p. 51) have shown that *Turdus gularis* Horsf. (1822) is preoccupied by *T. gularis* Lath. (1801). It would seem better to use the character and development of the nuchal crest rather than the color of the underparts.

Xanthixus flavescens berliozi Delacour

5 ♂ 3 ♀ Mt. Angka (2800–4300 ft.) 3, 5, 7, 9, 11, 13 March

This series agrees rather better with specimens from Laos and southern Yunnan than with birds of Karrenni and Bahmo, which have been compared in the American Museum of Natural History. Siamese and Indo-Chinese birds are as a rule darker and more greenish on the

breast and richer more golden yellow on the flanks and under tail coverts. Neither *vividus* Baker nor *berliozi* are well marked forms, however.

Measurements. Southern Yunnan (Loukouchai) 90; Laos (Phong Saly) 87; Siam (Mt. Angka) 84–89; Burma (Thoudoung, east of Toungoo) 83–89; Burma (Bahmo) 84–86.

Otocompsa jocosa erythrotis (Bonaparte)

2 ♂ 1 ♀ 1? Chiengmai, 17, 23 Feb.
1 ♂ Chiengdao, 18 Feb.
1 ♂ 1 ♀ Mt. Angka (4300 ft.) 3, 13 March
1 ♂ Mt. Nangkao (2800 ft.) 18 April

These specimens are at once separable from a series of eight specimens from Yunnan (Hokow, Loukouchai), which we may take to be representative of *jocosa*, by the whiter, less brownish gray underparts. The difference is striking. Two skins from Koon Tan, N. Siam are, however, marked with grayish brown on the flanks and are scarcely to be distinguished from Yunnanese birds. I do not think that the character of lighter back is to be relied upon because of seasonal variation and post mortem change. Specimens from India (*emeria*) are at once distinguishable by the longer red plumes beneath the eye.

Pycnonotus cafer klossi Robinson

3 ♂ Mt. Nangkao (2800 ft.) 19, 22 April

Not only have specimens from Siam smaller bills, as de Schauensee has remarked (Proc. Acad. Nat. Sci. Phila., **86**, 1934, p. 205) but they have shorter wings. A series from Yunnan measures 98–102 mm. for males and 95–96 for females. The series listed above measures 91–94, and a pair of topotypes (Koon Tan) 89 and 86 mm.

Ixos flavula hildebrandi (*sic*) (Hume)

1 ♂ Mt. Angka (4300 ft.) 1 March
1 ♂ 2 ♀ Mt. Nangkao (2800 ft.) 20, 21 April

The specimens from Mt. Nangkao have rather brownish heads but the male from Angka has a very black head and compares very closely indeed to specimens of *bourdellei* from Phong Saly, collected by Van Tyne in April. A pair from Doi Chieng Dao which de Schauensee

collected in January have also very black heads and compare closely to *bourdelli* in this respect. All Siamese specimens have grayer and darker underparts than my specimen of *bourdellei*, however.

Iole olivacea propinqua (Oustalet)

2 ♂ 1 ♀ Mt. Nangkao (2800 ft.)
1 ♀ Chieng Dao, 23 Feb.

Wings of males measure 88,90 mm. and those of females 84,85 mm. They are identical with a series from Laos (wings 84–88). A female from Szemao in southern Yunnan is yellower, not so gray on the breast; the wing measures 92 mm.

Microtarsus atriceps cinereoventris (Blyth)

1 ♂ 1 ♀ Chieng Dao, 26 April (wing 79, 80)
1 ♀ Chieng Dao 26 April (in gray phase) (wing 81)

This is the first record, as far as I can discover, of the gray phase of this species in Siam. This specimen has the breast gray with indistinct yellow edges to the feathers. The name *cinereoventris* is here used for the slightly larger, northern form of *atriceps* and does not imply that the gray phase is considered to be anything more than a mutation.

Mr. Chasen has written me as follows: "I agree that *Brachypodius cinereoventris* is a mutation. . . . It has not yet been shown that birds from Cachar (type loc. of *major*) differ from those of Tipperah (type loc. of *cinereoventris*) and it is highly improbable that they do so."

Brachypteryx cruralis cruralis (Blyth)

18 ♂ 6 ♀ Mt. Angka (8100 ft.) 24, 25, 30 March

Males in this series are uniformly gray on the belly. This character is quite unstable in series from China. In size these Siamese birds are identical with Indian birds and there are no other observable differences, except the grayness of the belly. This I believe to be a familial character which has arisen in small populations of these birds, isolated as they usually are.

Birds from China are slightly larger than those from India, Siam and Tonkin. There are no other differences. Chinese birds will therefore have to be called *B.c. formaster* Thayer and Bangs, which form was described from Wa Shan, a locality about 70 miles south east of Tat-

sienlou in Szechuan. The form from Mongtz, southern Yunnan, described as *B.c. laurentei* La Touche (1921) must be relegated to synonomy.

Measurements of Wings

Darjeeling and Sikkim (Rothschild coll.)

Males (4)	Females (3)
69.5–72	64–66

Tonkin

Males (4)	Females (3)
68–72	65–68

Delacour gives 56–70 for 37 examples from Tonkin.

Siam

Males (18)	Females (6)
68.5–72	64–69

Southern Yunnan

Males (3)
71–73

Likiang Range, Yunnan

Males (4)	Females (2)
71–73	69

Washan, western Sechuan

Males (Type of *formaster*)	Females (3)
74	67–71

Kinnear (Ibis, 1937, p. 267) states that males collected in Bhutan are dimorphic, being either brown or blue and that he has seen a male from Tonkin which is half blue half brown. I have sexed brown specimens as males in Laos and Tonkin. The testicles were very small however and the size small, as in females. It would seem more probable that the immature plumage is held over for more than a year in this species.

Brachypteryx leucophris nangka Riley[1]

2 ♂ Mt. Angka (4500, 6000 ft.) 1 March, 7 April
1 ♀ Chieng Dao (1280 ft.) Feb.

These specimens are somewhat darker than the types of *carolinae* La Touche of Fukien, but the difference might easily be due to a post mortem change, which is so very apt to occur especially where this

[1] Proc. Biol. Soc. Wash., 45, 1932, p. 59.

particular shade of olive brown is concerned. This race is very doubtfully retained.

For remarks on this species see Rothschild, Novit. Zool., **33**, 1926 p. 270; Delacour and Jabouille, Arch. Hist. Nat., Paris, **3**, 1927, p. 146; Robinson, Birds of the Malay Peninsula, **2**, 1928, p. 220.

Chaimarrornis leucocephala (Vigors)

1 ♀ Mt. Angka (4300 ft.) 27 Feb.

As Stuart Baker remarks, Chinese birds do seem to be larger. I think, however, that if the sexing of skins were correct that there would not be the overlap in size that now appears and that birds from Kansu, Szechuan and Hupeh would be found to be larger than birds from southern Yunnan, Tonkin and Siam.

India (Punjab) sexed by W. Koelz

1 ♂	1 ♀
100	87

Siam and Shan States sexed by de Schauensee

2 ♂	1 ♀
101, 98.5	86

Southern Yunnan (Mongtz, Loukouchai) sexed by Kobayashi

8 ♂	5 ♀
90, 91, 90, 98, 90, 100 98, 95	95, 94, 98, 88, 89

Kansu, Tibet (Przewalski and Rock, collectors)

4 ♂	1 ♀
92, 101, 104, 105	95

Hupeh (Ichang) sexed by W. Zappey

3 ♂	2 ♀
104, 104, 106	91, 91

Tarsiger cyanurus cyanurus (Pallas)

1 ♀ Mt. Angka (8100 ft.) 30 March

Females of *cyanurus* can be distinguished from those of *rufilatus* by the paler breast and the white marking in the throat, which is wider and extends into a "bib" on the upper breast. This is well illustrated

by three females taken on the Lena River in September, which represent the race *ussuriensis* and a long series of winter birds from China.

Tarsiger cyanurus rufilatus (Hodgson)

3 ♀ Mt. Angka (8100 ft.) 23, 28 March

One of these specimens has bright shiny blue upper tail coverts, not smoky gray like the other two and the forehead is blue. It may be that this is a juvenile male.

Rothschild (Novit. Zool., **32**, 1925, p. 298) with large series, finds that the race *practicus* Bangs of southern Yunnan "is a very poor subspecies," though he continues to recognize it in 1926 (p. 253). Baker synonymizes it without appearing to understand the differences as pointed out in the original description, for he says (Faun. Brit. Ind., Birds, **2**, p. 98) that *practicus* was described as being darker, whereas it was actually described as being somewhat lighter and grayer. Material from India in the British Museum proves it to be separable by just this character. See also Delacour, Oiseau, **10**, 1940, p. 157.

Turdus obscurus obscurus Gmelin

5 ♂ Mt. Angka (8100 ft.) 22, 28, 29 March
1 ♀ Mt. Angka (4300 ft.) 3 April
1 ♂ 2 ♀ Mt. Angka (5700 ft.)

There appear to be three types of plumage in this series. Specimens A, B, C, a male and two females taken at 8100, 5700 and 4300 ft., are typical of *obscurus*, of which there are breeding specimens from Siberia in this museum. The male has a white chin but the throat and breast are gray, the feathers with concealed white bases.

Specimens D and E, a pair taken at 5700 ft., have a line of white, speckled with grayish brown extending from the chin to the upper breast.

Specimens F–I, males taken at 8100 ft., resemble females of typical *obscurus* except that they are somewhat darker and grayer on the breast. Their tails are slightly shorter.

All specimens differ from *chrysolaus*, of which I have seen two topotypical males from Sachalin Island, in having a distinct white supraocular stripe and in being slightly larger. Specimens D and E have the first primary wider and longer as in *chrysolaus* (see Hartert, Vog. Pal. Faun., **1**, page 656).

Turdus o. subobscurus Salvadori, which is known from a single

specimen from Tenasserim, is said to be larger than *obscurus* and with a different wing formula, the 3d and 4th primaries being subequal and longest and the 2d between the 5th and 6th. It is curious that this is the formula of *chrysolaus* as well. From descriptions of *subobscurus* it would appear that it is somewhat larger than *chrysolaus* (wings measure 130 as against 135), that both lack the supraocular stripe, that they are both paler than *obscurus*, but they differ from each other in the color of the throat which is gray in *subobscurus*, while in *chrysolaus* it is white streaked with gray.

It may be that with larger series it will be found that the color of the throat is due to age or individual variation, in which case *subobscurus* would be a rather large specimen of *chrysolaus* in winter quarters; it was collected on March 8. On the other hand there may still be unknown populations.

Measurements

Male			Female		
Wing	Tail		Wing	Tail	
128	86	Spec. A	121	75	Spec. B
126	87	" D	121	77	" C
123	80			85	" E
124	81				
124	79				
125	80				
		Sachalin Island (*chrysolaus*)			
119	78				
121	81				
		Siberia			
128	85		115	75	

Zoothera marginata parva Delacour

1 ♂ 1 ♀ Mt. Angka (8100, 5700 ft.) 17, 23 March
1 ♀ Mt. Nangkao (2800 ft.) 17 April

I have no material of this rare bird for comparison but Stuart Baker gives measurements of the culmen of *marginata* as 28–29 mm., while Delacour gives 22–25 for his race. My birds measure 23–25 mm.; a female from Chapa, Tonkin and a pair from Laos measure 26 mm.

Monticola solitaria pandoo (Sykes)

1 ♂ Chiengmai, 24 Feb.
1 ♂ Mt. Angka (4300 ft.) 4 March

The bird from Mt. Angka is very dark blue without a trace of chestnut and with scarcely a trace of the gray tips to the feathers. The Chiengmai bird on the other hand compares very closely to birds from Yunnan. They are also bright blue with scattered gray tipped feathers and a little chestnut on the under tail coverts. They are all somewhat darker blue and with less gray and chestnut than *affinis*.

Cochoa purpurea Hodgson

1 ♀ Mt. Saket (1280 ft.) 23 Feb.

This constitutes the first record of this bird for Siam. The discovery is not surprising, however, for Delacour has recorded it from the center and the northwest of Tonkin (Ois. d'Ind. Chine Franc., **3**, p. 143) and its known range previous to that was from Assam through the hills of central and south Burma to Tenasserim (Baker, Faun. Brit. Ind., **2**, p. 184).

Muscicapula hodgsonii (Verreaux)

4 ♂ 7 ♀ Mt. Angka (4300–8100 ft.) 26 Feb. 2, 6, 7, 26, 31 March

These specimens differ in no way from long series from Kansu, Szechuan and Yunnan. As might be expected, birds taken in the autumn, in worn plumage, are somewhat paler than those taken in spring.

Muscicapula hyperythra hyperythra (Blyth)

6 ♂ 2 ♀ Mt. Angka (8100 ft.) 22, 23, 24, 28 March

There is no difference between these birds and series from northern Cachar (Guilang) and upper Assam (Margherita) which have been examined in the American Museum of Natural History. Females are somewhat more olive, particularly on the back, but this is undoubtedly due to post mortem change.

Muscicapula melanoleuca melanoleuca Blyth

1 ♂ Mt. Angka (4300 ft.) 12 March

Apparently de Schauensee and Chasen are agreed that the bird of Mt. Soutep is *melanoleuca*, not *westermanni* (Proc. Acad. Nat. Sci. Philad., **86**, 1934, p. 214; Journ. Siam Soc., Nat. Hist. Suppl., **8**, 1932, p. 239).

Muscicapula banyumas whitei (Harington)

5 ♂ 5 ♀ Mt. Nangkao (2800 ft.) 9, 13, 16, 17, 20 April

Though these specimens differ slightly from typical *whitei* of northern Burma[1] the differences are too slight for formal recognition. In series the breast appears to be more sharply defined; the brown does not extend down to the flanks. de Schauensee, who examined this series with me in Philadelphia, agrees with me as to the identification.

8 ♂		Siam	2 ♀	
Wing	Tail		Wing	Tail
58–61	39–43 (av. 40)		55.5	36

Yunnan (Mongtz)

6 ♂		8 ♀	
60–61	41–45 (av. 42–4)	58–60	37–39

Yunnan (Tao-mung-Chung, Likiang Dist.)

2 ♂	
63	44–45

India

55–63 (Baker)	38–40 (Baker)

Assam

1 ♂		1 ♀	
59	40	57	40

Muscucapula hainana (Og. Grant)

1 ♂ Mt. Nangkao (2800 ft.) 11 April

Alseonax latirostris latirostris (Raffles)

These specimens do not differ to any great extent from Siberian examples (*poonensis*). They are slightly grayer on the breast but otherwise do not differ at all. Specimens from Yunnan are quite indistinguishable.

[1] Material examined from the type locality, from southeastern Yunnan and from other localities in northern Siam shows that the populations are identical.

Siberia, Mongolia, northern China

Males		Females	
Wing	Tail	Wing	Tail
71	52 (No. Mongolia)	74	53 (W. Siberia)
71	50 (Shansi)	72	50 (S. ")
	Yunnan (Mongtz, Loukouchai)		
74	51	71	51
70	47	67	48
67	47	66	45
68	49	68	48
71	51		
	Siam		
71	49	68	48
67	50	67	47

NILTAVA GRANDIS GRANDIS (Blyth)

7 ♂ 6 ♀ Mt. Angka (4300-8100 ft.) 17 Feb., 1, 17, 22, 23 March

The described forms of this species are as follows:

Niltava g. grandis (Darjeeling)
" " *decipiens* (Sumatra)
" " *decorata* (Annam)
" " *nobilis* (Mt. Angka, Siam)
" " *griseiventris* (Yunnan)

Long series of *grandis* in the British Museum show a wide range of individual variation in the color of the head and nuche which may be brown or blue in females. Birds from Laos as well as northern Siam prove to be *grandis*. Of these forms only *grandis*, *decipiens* and *decorata* can be maintained.

Between males there is no discoverable color difference which is not ascribable to age. Paleness and grayness of the underparts is due usually to immaturity; most grayish specimens having the under tail coverts brownish or tipped with brown, or sometimes whitish. Males of *decipiens* are, however, smaller than *grandis*.

Material examined in A.M.N.H. and measurements:

decipiens

5♂ 7♀ Sumatra: Delhi, Bandar Baroe and Karinchi (in the Barison Mts.)

Wings of males 92–96 mm.

4♂ 3♀ Malaya: Gunong Tahan, Semangko Pass, Selangor, Gunong Ijau, Perak
Wings of males 94–96 mm.

"nobilis"

3♂ 7♀ Tonkin: Fan-si-pan range, Chapa
Wings of males 104–112 mm.

1♂ 1♀ Southern Shan States: Mong-Kong

"nobilis"

7♂ 6♀ Siam: Mt. Angka
Wings of males 102–107 mm.

"griseiventris"

2♂ Southeastern Yunnan: Loukouchai
Wings of males 101–102 mm. (Type)

"griciventris?"

2♂ Yunnan: Tengueh, Schweli-Salween divide
Wings of males 104, 112 mm.

decorata

2♂ 1♀ Cochin China: Langbian Peak, Djiring, Annam
Wings of males 97–100 mm.

grandis

7♂ 5♀ India: Sikkim, Darjiling, Upper Assam, Manipur, N. Cachar
Wings of males 102–108 mm.

Rhipidura albicollis albicollis (Vieillot)

2 ♂ 2 ♀ Mt. Angka (4300–6000 ft.) 3, 5, 12 March
1 ♀ Mt. Nangkao (2800 ft.) 14 April

Examination of large series in the American Museum, New York and the British Museum shows that *celsa* Riley cannot be naintained.

Cyanoptila cyanomelana cumatilis Thayer & Bangs

1 ♂ Mt. Nangkao (2800 ft.) 8 April

This single specimen is only provisionally referred to the above form for it is different from any specimen of the Chinese bird in the collections of the Museum of Comparative Zoölogy or the American Museum of

Natural History. Since there is a certain amount of individual variation in this form and since we do not know where the bird breeds or indeed anything about it, it would not appear to be wise to describe it here.

I cannot find that this form has ever before been taken in Siam.

Lanius nigriceps nigriceps (Franklin)

2 Mt. Angka (4300 ft.) 3, 9 March

The upper back of these specimens is grayish, but they are intermediate in size between *nigriceps* and *longicaudatus* Og. Grant of southern Siam.

♂		♀	
Wing	Tail	Wing	Tail
Southern Yunnan (Mongtz)			
100	127	94	121
96	118 (worn)	97	122
		99	126
		96	125
Siam (Mt. Angka)			
		96	130
		98	120 (worn)
Siam (Bangkok)			
97	153	95	136

Hemipus picatus capitalis McClelland

1 ♂ Mae Wan River near Mt. Saket, 21 Feb.
1 ♂ Mt. Angka (4300 ft.) 3 March
5 ♂ 2 ♀ Mt. Nangkao (2800 ft.) 11, 13, 14, 16 April

Although it appears likely that this brown backed form and the black backed form are only phases of plumage, still only field work can prove this to be so. Every specimen in this series has a brown back.

Pericrocotus flammeus elegans McClelland

1 ♀ Chieng Mai, 23 Feb.
1 ♂ Chieng Dao, 20 Feb.
2 ♂ Mt. Saket, 23 Feb.
1 ♂ 2 ♀ Mt. Angka (4300 ft.) 3, 14 March
3 ♂ Mt. Nangkao (2800 ft.) 14, 15, 17 April

These specimens differ from *P. f. bakeri* La Touche of southern Yunnan and Laos in having the entire outer web of the central tail feathers red, not black edged with red. They are also slightly smaller.

♂		♀	
Wing	Tail		
	Mt. Nangkao (2800 ft.)		
97	87		
95	86		
94	86		
	Mt. Angka (4300 ft.)		
96	89	96	85
		94	86
	Mt. Saket (1280 ft.)		
95	90		
	Chieng Dao		
94	92		
	Koon Tan & Chieng Mai		
95	88	94	89
		97	92
	Yunnan (Loukouchai)		
102	95.5 (cotype)	100	100 (cotype)
	Laos (Muong Moun)		
100	100	97	95

Chaptia aenea aenea (Vieillot)

2 ♂ 2 ♀ Mt. Angka (4300 ft.) 12 March
1 ♂ 1 ♀ Mt. Nangkao (2800 ft.) 16 April

These specimens from their size would appear to be *aenea*, not *malayensis* which Deignan records from north Siam (Journ. Siam Soc., Nat. Hist. Suppl., **10**, 1936, p. 101)
Wings of males measure 122, 125, 125 and tails 118, 120, 118.
Those of females measure 123, 117 and 115, 112.

Tribura thoracica thoracica (Blyth)

1 ♀ Mt. Angka (4300 ft.) 3 March

This specimen is very close to birds of the Likiang District, Yunnan. It differs slightly, however, in having the breast more brownish. From

Tribura thoracica davidi La Touche of southern Yunnan, it differs, as do northern Yunnanese specimens, in its longer tail and darker color.

Eastern forms of *Orthotomus sutorius*

The forms with which we are here concerned are as follows: *O. s. patia* Hodgson 1845 (t. l. Nepal), *O. s. longicauda* (Gm.) 1788,[1] *O. s. inexpectatus* La Touche 1922 (t. l. Mongtz, southern Yunnan). A number of forms have been described from India by W. Koelz (Proc. Biol. Soc. Washington, **52**, 1939, p. 70) of which I have no material.

From the material at hand it would appear that typical *longicauda* differs from all other forms in its buffy underparts; that *patia* (assuming that northern Cachar birds are *patia*) differs in its buffier, not as grayish, ear coverts, and that topotypical *maculicollis* is a very dark form with the feathers of the ear coverts almost black with silvery shaft stripes. *Inexpectatus*, therefore, differs from *longicauda* in its grayer, not buffy, underparts, from *patia* in its grayer, less buffy, ear coverts, and from *maculicollis* in its grayer, not blackish, ear coverts. It is also somewhat brighter and darker green above than *longicauda* or *patia* but not as dark as *maculicollis*. Birds from northern Siam and northwestern Laos belong to this race.

Although birds from southern and eastern Siam are a trifle paler than *inexpectatus* I do not think that the difference is sufficient for formal description. Skins from peninsular Siam are intermediates, *maculicollis* = *inexpectatus*, though they show an approach to the more northerly populations in their slightly paler coloration. There is considerable variation.

A pair from Mt. Victoria are extremely pale.

Measurements: Fukien ♂ 45–46, ♀ 44–45; southern Yunnan ♂ 46–51, ♀ 44–47; northern Siam ♂ 42–46, ♀ 40–44; central Siam ♂ 44–46, ♀ 42–44; northwestern Laos ♂ 44, ♀ 41; northern Cachar ♂ 44, ♀ 41–44; Malaya ♂ 45–48; Peninsular Siam ♂ 44–46, ♀ 43.

Seasonal variation: Birds shot in April and May are brighter chestnut on the forehead and somewhat brighter green on the back. The extremely elongated central tail feathers (15–20 mm. longer) appear to be acquired in early April and may be retained in a worn condition until August.

Sexual variation: I do not think it is always possible to distinguish males from females after the post nuptial molt. I cannot find that

[1] Phyllorapheus Swinhoe 1860, described from Amoy is a synonym. I hereby restrict the type locality of *longicauda* to Amoy.

the ear coverts vary with sex as has been suggested. Birds of the year have a more rounded first primary.

Material examined: 14 ♂ 7 ♀ Mongtz, southern Yunnan (all seasons of the year); 2 ♂ 2 ♀ 2 ? Foochow, China (February, April, October, December); 1 ♂ 3 ♀ Gunyon, northern Cachar (March, July, December); 3 ♂ 1 ♀ Selangor, Perak, Malacca and Kuantan sea coast, Malaya (January, March, May, December); 10 ♂ 8 ♀ Bangkok, Kan Buri, Siam (April, May, June, September, October, December); 4 ♂ 4 ♀ Ban Wang Lung, Ban Nam Kien, Mt. Nangkao, northern Siam (January, April, October); 2 ♂ 1 ♀ Tuong, Bang Nana, Peninsular Siam; 2 ♂ 2 ♀ Muek-Lek, Pak-Chong, Lat-Boua-Kao, eastern Siam.

Remarks: There has been a good deal of confusion in this group due to the poorly marked characters of the subspecies and the paucity of material from topotypical localities in muse ms.

La Touche described *inexpectatus* in 1922, Kinnear synonymized it with *longicauda* in 1929, Delacour followed him in 1930, Ticehurst in 1938, and Delacour and Greenway in 1940, while Bangs (1929 and 1930) continually maintained its validity. There can be no doubt that Bangs was right.

The series at hand is possibly inadequate. Even with six specimens, representative of every season, from Fukien, it may be found that the more buffy underparts, apparently diagnostic in this series, may disappear with more material.

Phylloscopus davisoni davisoni (Oates)

3 ♂ Mt. Angka (4300, 8100 ft.) 6, 22, 29 March

These specimens have the characteristic white inner webs to the outer rectrices. They have been kindly identified by Dr. Ticehurst in London.

Phylloscopus reguloides assamensis Hartert

9 ♂ 1 ♀ Mt. Angka (8100 ft.) 22, 23, 24, 29, 30 March

This series was also identified by Dr. Ticehurst but apparently with some doubt for he says "I cannot make anything else of them." They are all very dark and stained, probably by a forest fire of which the collecting party wrote.

Phylloscopus maculipennis maculipennis (Blyth)

2 ♂ 2 ♀ Mt. Angka (8100 ft.) 22, 30 March

These birds are slightly smaller than measurements given by Hartert and by Ticehurst but not smaller than those given by Stuart Baker. Wings of males measure 45, 46, and tails 33, 35; those of females 45, 47 and 32, 33.

Ticehurst (1938, p. 122) considers *debilis* to be a synonym of *maculipennis*. This species seems never before to have been recorded from Siam. Delacour records it from the border of Tonkin and Yunnan on the Fansipan range, however.

Phylloscopus pulcher pulcher Blyth

5 ♂ 1 ♀ Mt. Angka (8100 ft.) 24, 25, 27, 30 March

Ticehurst finds (1938, p. 98), that *vegetus* Bangs of Yunnan can be nothing by a synonym of *pulcher*. The differences noted are in his opinion and mine due to post mortem change.

Siamese birds at hand agree perfectly with a series of Yunnanese examples.

Wings of males measure 56.5–61 and tails 42–44.

Phylloscopus trochiloides trochiloides (Sundevall)

1 ♂ 1 ♀ Mt. Nangkao (2800 ft.) 8, 18 April

These birds are in very worn plumage and are moulting. They measure 55, 64 (wing); 44, 51 (tail); 15 (bill from base). They are assigned with some doubt to this species, though they are closest to it.

Abroscopus albogularis hugonis Deignan

1 nestling ♀ Mt. Nangkao (2800 ft.) 9 April

This is the southern-most record for this form. Stanford and Ticehurst (1935) record it from northern Burma.

Zosterops palpebrosa joannae La Touche

2 ♂ 3 ♀ Mt. Nangkao (2800 ft.) 8, 13, 14, 15 April

Since writing his last paper on Zosterops (Journ. f. Orn., **87**, 1939, pp. 156–164), Stresemann, having seen topotypes of *Zosterops palpebrosa joannae* and many specimens collected by Deignan in Siam, has changed his mind. He writes on August 25, 1939 to James Peters:

"*Palpebrosa* from Mengtz, called *joannae* by La Touche, is very near to *mesoxantha* Salvadori, but has the flanks a slightly darker grey and the upperside more greenish, less yellowish. The name *joannae* may stand, therefore, but the racial characters are very feebly pronounced."

Stresemann does not make it clear whether or not he now considers *mesoxantha* to be separable from *palpebrosa*, with which he synonymized it (op. cit. p. 163). I have not seen *mesoxantha*, which was described from Karrenni, but the northern Siamese specimens listed above are quite as dark as *joannae* and otherwise inseparable; they are paler and yellower on the back than *Zosterops* (*japononica* ?) *simplex* with which *joannae* occurs in southern Yunnan at all seasons. Specimens from Tonkin and Laos are also inseparable from *joannae*.

Seasonal variation in this form is slight but to be noticed, birds killed in March and April being somewhat darker and greener on the back than those taken in November and December. Individuals may or may not have a faint yellow line down the middle of breast and belly.

Material examined: 9 ♂ 7 ♀ Mongtz, southern Yunnan; 6 ♂ 3 ♀ Xieng Khouang, Taloun, Lo-Tiao, Laos, as well as long series of *simplex* from these places.

Chalcoparia singalensis interposita Rob. & Kloss

2 ♂ 1 ♀ Chieng Dao, 20 Feb., 28 April

These two males are indistinguishable from two males from Laos, which on geographic grounds should be *koratensis* (t. ll. E. Siam). Exactly as Robinson and Kloss described *interposita* (Journ. Fed. Malay St. Mus., **10**, 1921, p. 209; t.l. Peninsular Siam) Laotian males have the rufous of the foreneck extending over the upper breast and ending gradually. The remaining lower parts are quite as bright yellow. I have recorded these specimens as *interposita* because there is not enough material at hand to do otherwise than follow. Series should be examined.

Arachnothera longirostris longirostris (Latham)

1 ♂ 1 ♀ Mt. Angka (4300 ft.) 3, 4 March
1 ♂ 1 ♀ Mt. Nangkao (2800 ft.) 11, 19 April

Though I have seen no specimens from India, it would appear that the validity of *sordida*, La Touche (Bull. B.O.C., **42**, 1921, p. 32) which seems to have been based on the shorter bill, is very doubtful.

Chasen (Bull. Raffles Mus., Singapore, **11**, 1935, p. 281) has synonymized *antelia* Oberholser (1923) of Peninsular Siam. Bills of Siamese birds measure 40.5, 40 mm. (male); 37, 36 mm. (female) while that of the type of *sordida* measures 36 mm.

Aethopyga nipalensis angkanensis Riley (1929)

34 ♂ 15 ♀ Mt. Angka (8100 ft.) 23, 24, 25, 28, 31 March

Two of these birds J. A. Griswold, Jr., the collector, reports were breeding. He writes "they were both collected with their nest which had no eggs in it. The nest was about twenty feet from the ground at the end of a small branch. In the two nests which I observed being built the female did all the work."

Blythipicus pyrrhotis annamensis Kinnear

1 ♂ Mt. Nangkao (2800 ft.) 15 April

This specimen is indistinguishable from Indo Chinese birds and differs from Indian birds by its brilliant red nuchal collar and the strong reddish tinge of the mantle.

Cyanops asiatica asiatica (Latham)

1 ♂ Chieng Dao, 23 Feb.
2 ♂ Mt. Angka (4300 ft.) 3, 9 March
2 ♂ 1 ♀ Mt. Nangkao (2800 ft.) 18 April

Schauensee (1934) records *davisoni* from northern Siam with the remark that all his specimens but one show a trace of blue on the vertex. One specimen at hand shows a faint trace of blue on the vertex as do many Indian specimens, but these have black vertices and are clearly referable to *asiatica*.

Merops orientalis birmanus Neumann

1 ♀ Chieng Dao, 24 Feb.
1 ♂ 1 ♀ Chiengmai, 16 Feb.

These specimens are indistinguishable from those from southern Yunnan. It may be that this bird should be called *ferrugiceps* Anderson (see Rothschild Nov. Zool., **33**, 1926, p. 244). Peters tells me that the validity of this name depends on the adequacy of the bibliographic

reference used by Gray in citing the name as a synonym in the Catalogue of the Birds of Nepal, 1846, p. 58. I have not seen this paper.

Ceryle lugubris guttulata Stejneger

1 ♂ 3 nestlings Mt. Angka (4300 ft.) 14 April

Batrachostomus hodgsoni indochinae Stresemann

1 ? Mt. Angka (4300 ft.) 17 April

This is unfortunately a juvenal bird so that any accurate subspecific identification is impossible. It is, however, the first time that this species has been taken in northern Siam. There cannot be much doubt that Stresemann's surmise that this form occurs in Karrenni is correct (Mitt. Zool. Mus. Berlin, **22**, 1937 p. 320).

Otus spilocephalus latouchi (*sic*) (Rickett)

1 ♂ Mt. Angka (4300 ft.) 7 April

This specimen agrees well with birds from northern Tonkin and northern Annam. There is a certain amount of individual variation in the spotting of the underparts and the lightness or darkness of the breast. It is slightly paler than a specimen from the region of the Chindwin (*vide* Mayr, Ibis, 1938).

The wings measure Siam 144 mm., Tonkin (Chapa) ♀ 158, Tonkin (Laokay) ♂ 146, Annam (Hoi Chuan) ? 144.

Otus sunia modestus (Walden)

1 ♂ juv. Chiengmai, 29 April

Apparently this bird had just come out of the nest a month or so before it was collected. But for the fact that two mature feathers molting in on the breast show the characteristic black central streak of this species, the bird might be a gray phase of *spilocephalus*.

Huhua nipalensis nipalensis (Hodgson)

1 ♂ Mt. Angka (4300 ft.) 8 April

Phodilus badius saturatus Robinson

1 ♂ Mt. Nangkao (2800 ft.) 12 April

Wings measure 210 mm., sec., Robinson, B.B.O.C., **47**, 1927 (see p. 121)

Spilornis cheela burmanicus Swann

1 ♂ Chiengmai, 26 Feb.

Columba pulchricollis Blyth

1 ♂ 1 ♀ Mt. Angka (8100 ft.) 29, 30 March

BIRDS FROM MT. KINA BALU, NORTH BORNEO

By James L. Peters

ACCIPITRIDAE

Accipiter virgatus virgatus (Temminck)

2 ad. ♂, 1 ad. ♀, 3100 feet, 9–26 August, 1937.

None of the three specimens has completed the post-nuptial molt and for this reason wing and tail lengths cannot be measured; the tarsal length is 47.5, 45, 48 mm.

Ictinaëtus malayensis malayensis (Temminck)

1 ♀, 3100 feet, 11 August, 1937.

Compared with a male of *I. m. perniger* from Mt. Angka, Siam, the Bornean bird is much blacker throughout and definitely smaller, wing 550 against 570; if corresponding sexes were to be measured the difference in size would doubtless be even more apparent.

PHASIANIDAE

Arborophila brunneopectus erythrophrys (Sharpe)

2 ad. ♂, 4 ad. ♀, 2 juv. ♂, 1 juv. ♀, 5000–5500 feet, 10 June- 16 July, 1937.

This race was originally described from an adult pair collected on Kina Balu by John Whitehead. When first studying Whitehead's collections, Sharpe thought the specimens represented the young of *A. hyperythra* described by himself from the Lawas River in 1879, but later became convinced that the characters on which *erythrophrys* (*i.e.*, rusty lores, superciliary and sides of face as opposed to the ashy gray color of the corresponding parts of *hyperythra*) was based were not an age character. *A. erythrophrys* was upheld by Ogilvie-Grant in Cat. Bds. Brit. Mus., **22**, 1893, p. 218 but was later synonymized with *hyperythra* by Sharpe himself in his Hand-list, **1**, 1899, p. 29. As far as I can discover this was its fate until reinstated by Chasen, Bull. Raffles Mus., no. 11, 1935, p. 3 in a laconic footnote that reads "*A. erythrophrys* and *A. hyperythra* are distinct forms." I have not seen the latter race, but all the Kina Balu specimens agree with the plate of *erythrophrys* in Ibis, 1890, pl. 4, the rusty parts of the head and face are present in both adults and juvenals. The old females have

more black in the crown than the males, and in one the crown and lores are entirely black. The color of the throat varies independently of age or sex; in one male and one female it is entirely reddish brown; in the other male chiefly so but with a few scattered feathers with black centres, the other three females all have a sprinkling of black centered feathers. The feathering on the throats of the juvenals is rather sparse, but there is enough to show that the chin is whitish and that the black freckling is variable; it is much more extensive and noticeable in the juvenal female than in the two males.

Haematortyx sanguiniceps Sharpe

1 ad. ♂, 1 ad. ♀, 1 imm. ♂, 1 imm. ♀, 1 juv. ♀, 5500 feet, 21 June-8 July, 1937.

The crimson-tipped undertail coverts are fully developed in both the immature birds. The adult male has three spurs on the left tarsus, two on the right. Compared with an adult male from Mt. Dulit, the Kina Balu male is a clear slatey black, not brownish black, but quite possibly the brownish cast to the plumage of the former specimen is due to a post mortem change.

RALLIDAE

Rallina fasciata (Raffles)

1 ♂, 3000 feet, 13 July, 1937.

The single specimen of this rail has the middle of the abdomen white, instead of being regularly barred with black and white like the flanks, as is the case of three old specimens without data, that are available for comparison.

COLUMBIDAE

Treron vernans griseicapilla Schlegel

1 ad. ♂, 1 juv., sea level, 4 and 6 September, 1937.

Two races of this fruit pigeon occur in Borneo, *griseicapilla* in northern and *purpurea* in southern and southeastern. However the boundary between the two races is by no means clearly defined. Mayr (1938 p. 10) refers specimens from Parit, on the Tjempaga River, south Borneo to *purpurea* (type locality, Java) qualifying his identification by the statement that they are somewhat intermediate between

griseicapilla and *purpurea* but nearer the latter. Stresemann records specimens of *T. v. griseicapilla* from the Bahau River in northern Dutch Borneo.

In addition to the birds listed above I have available for comparison with two topotypical Sumatran males of *griseicapilla* the following Bornean specimens:—1 ♂, Baram, 1 ♂, Tawao, 1 ♂, Limbang, 1 ♂, Poelau; the Jesselton bird and the first two listed are surely *griseicapilla;* the two latter are best placed as intermediate between *griseicapilla* and *purpurea* but nearer the former.

Ducula aenea aenea (Linné)

2 ♀, 3100 feet, 18 and 22 August, 1937.

North Bornean examples of *D. aenea* as Chasen and Kloss (1930, p. 13) have already pointed out, differ from *D. a. palawanensis,* the nearest geographic relative, in having the pale head and neck sharply defined from the color of the back and in being smaller. Four Palawan specimens have a wing measurement of 236, 239, 243, 247; North Bornean skins run 225, 228, 229, 235; other Bornean measurements, including 3 from the interior measured by me, 5 ♂ and 2 ♂ from southern Borneo by Mayr and a north Bornean ♀ by Chasen and Kloss run from 230–241; Stresemann's single ♀ from Badang is the largest with a wing of 244.

Ducula badia badia Raffles

3 ♂, 3100 feet, 15–25, August; 1 ♂, 2 ♀, 1 not sexed, 5500 feet, 11 June-31, July; 1 ♂, 7000 feet, 21 July, 1937.

A male and female of topotypical *badia* from Sumatra have wings 231 and 218 mm. respectively, while the Kina Balu series measures, males, wing 220, 227, 232, 233; females 221, 233, 234. Both Sumatran birds, the male especially, have the crown much clearer gray, less washed with vinaceous than the Kina Balu series.

Macropygia ruficeps nana Stresemann

5 ♂, 1 ♀, 3100 feet, 27 July-25 August; 1 ♀, 4790 feet, 7 July; 2 ♂, 1 ♀, 5500 feet, 21 June-30 July, 1937.

This nice series is virtually topotypical; the type came from an elevation of 3000 feet on Mt. Kina Balu.

CUCULIDAE

Cuculus sparverioides bocki (Wardlaw Ramsay)

2 ♂, 3100 feet, 27 July and 18 August; 1 ♂, 4500 feet, 6 June, 1937.

Wings 172, 178, 185.5; tails 164, 168, 177.

Cuculus fugax fugax Horsfield

2 ♂, 3100 feet, 11 August, 1937.

Wings 168, 170.

Cuculus poliocephalus insulindae (Hartert)

1 ♀, 4700 feet, 6 June; 1 ♂, 1 ♀, 5500 feet, 12 June and 21 July, 1937.

Topotypes of the subspecies, originally named from Kina Balu.

Cacomantis merulinus threnodes Cabanis & Heine

2 ♂, 3100 feet, 26 August, 1937.

Chalcites malayanus malayanus (Raffles)

1 ♂, 3100 feet, 26 August, 1937.

This is apparently an immature bird; the underparts are plain grayish white, bars are apparent on the posterior flank feathers and a single barred feather has made its appearance on the breast. A male collected by H. G. Deignan at Abai, Borneo, 28 July, 1937 is in a more advanced stage of this same plumage, numerous barred feathers having made their appearance on the underparts, but the completely barred under surface of the adult plumage is not yet fully developed.

STRIGIDAE

Otus spilocephalus luciae (Sharpe)

1 ♂, 2 ♀, 6000 feet, 5–8 July, 1937.

This form was originally described from specimens collected on Kina Balu by Whitehead during his second expedition. He found it only "in the dark and gloomy forests which occur in large patches at about 9000 feet."

The bird is now known to occur on other mountains in Borneo and is probably not as restricted in its altitudinal range as first supposed. The Museum of Comparative Zoölogy possesses a skin from Mt. Dulit collected at an elevation of only 3400 feet.

APODIDAE

Collocalia vestita maratua Riley

1 ♂, 1 ♀, 3100 feet, 8 and 9 August, 1937.
♂, wing 116.3; ♀, wing 115.1

Collocalia esculenta dodgei Richmond

1 ♂, 1 ♀, 4900 feet, 3 July, 1937.

This small montane form was originally described from Mt. Kina Balu; according to Chasen it occurs on other mountains in northern Borneo and on Korinchi Peak, Sumatra.

The measurements of the two specimens before me are ♂, wing 91.5, tail 35; ♀, wing 90.5, tail 31.5 mm.

A female of *C. e. cyanoptila* from Sandakan has a wing of 99.3 and tail 36.6; it is also a much glossier bird.

CAPITONIDAE

Chotorhea chrysopogon chrysopsis (Goffin)

1 ♂, 1 ♀, 3100 feet, 12 and 21 August, 1937.

These birds are identical with birds from the Bornean lowlands from the region about Sandakan.

Cyanops monticola Sharpe

3 ♂, 3100 feet, 23 and 24 August; 2, not sexed, 3500 feet, 27 June; 1 ♂, 1 ♀, 4750 and 4900 feet, 7 June and 3 July; 1 ♂, 5500 feet, 18 July, 1937.

I cannot agree to the inclusion of *monticola* in the *oorti* Formenkreis; the latter association should of course include *nuchalis* and *annamensis* and probably *incognita* and *faber*, but according to my conceptions *monticola* is definitely out; of course it does not belong in Chotorhea where Sharpe placed it in his Hand-list, it seems to fit better in Cyanops.

It is a species of an arrested or retrograded type of color and pattern, the throat is never golden yellow, the definite black markings on the sides of head are entirely lacking, there is no red spot on the lores or across the forehead; in addition the bill is relatively much larger.

Cyanops armillaris pulcherrima (Sharpe)

1 ♂, 3100 feet, 23 August; 4 ♂, 8 ♀, 5500 feet, 10 June-26 July; 3 ♂, 7000 feet, 18– 31 July, 1937.

This form is no doubt correctly placed as a montane representative of the Javan *armillaris* which is also replaced in the Bornean lowlands by *C. a. brachyrhyncha* Neumann, the latter occupying a more or less intermediate position between the two extremes. In addition to the large series collected by Mr. Griswold I have examined another Kina Balu specimen taken by Everett's native collectors and a ♂ and ♀ from Mt. Tibang, Dutch Borneo collected by E. Mjöberg. None of the specimens examined show the slightest approach to *C. a. brachyrhyncha.*

Cyanops eximia cyanea (Harrisson and Hartley)

Mesobucco duvaucelii cyaneus Harrisson and Hartley, Bull. Brit. Orn. Cl., **54**, 1934, p. 151 (Mt. Kina Balu.)

1 ♀, 3500 feet, 27 June, 1937.

This form was very briefly characterized in the original description as having "frontal band blue, not black or blue-black." As poor a description as can be imagined!

Chasen regards both *eximia* and *cyanea* as races of *C. australis* which is represented in the Bornean lowland by *C. a. duvaucelii.* Mayr believes that *eximia,* (type locality, Mt. Dulit), a montane form, should be accorded specific rank in which I concur. The comparative differences between *C. a. duvaucelii, C. e. eximia,* and *C. e. cyanea* are shown in the following table:

Throat blue	*cyanea*
	duvaucelii
Throat black	*eximia*
Ear coverts blue	*cyanea*
	eximia
Ear coverts black	*duvaucelii*
Forehead blue	*cyanea*

Forehead black	*duvaucelii*
	eximia
Subocular spot red	*duvaucelii*
Subocular spot yellow	*cyanea*
	eximia
With red on crown	*cyanea*
With red on occiput	*eximia*
No red on head	*duvaucelii*

It might be well to mention that in *C. australis*, the longest facial bristles extend well beyond the tip of the bill while in the specimens of *cyanea* examined they barely reach the tip, the same condition is found in *eximia* if the plate in the Ibis, 1892 is accurate.

PICIDAE

Callolophus miniaceus dayak Stresemann

1 ♀, 3100 feet, 16 August, 1937.

According to Chasen it is *C. m. miniaceus* that occurs on the lower slopes of Kina Balu, but this specimen with a wing of only 112 mm. is clearly identifiable as the small *dayak;* in the typical race the wings range from a minimum of 120 for females to a maximum of 134 for males.

Chrysophlegma mentale humii Hargitt

1 ♂, 1 imm. ♂, 5500 feet, 16 and 29 June, 1937.

In size these birds are about the minimum for *humii* and thus approach the smaller *saba* of southern and eastern Borneo; the ad. ♂ has a wing of 125, the immature one of 124 mm. The presence of a slight admixture of chestnut in the feathers of the malar stripe of the adult throws the scales in favor of *humii.*

EURYLAIMIDAE

Calyptomena whiteheadi Sharpe

3 ad. ♂, 1 imm. ♀, 5000–5500 feet, 24 July– 3 August, 1937.

I can detect no differences between this topotypical series and a pair collected by Mjöberg at about 4000 feet on the upper Kajan River near Mt. Tibang.

Psarisomus dalhousiae borneensis Hartert

1 ad. ♂, 1 imm. ♂, 1 ♀, 3100 feet, 23 and 24 August; 3 ♂, 1 imm. ♀, 5500 feet, 18 June– 28 July, 1937.

The Bornean race of this bird is very close to *psittacinus*, the form inhabiting the Malay States and Sumatra, but is of a yellower green, the difference is not too apparent unless *psittacinus* and *borneensis* are compared in series.

Eurylaimus ochromalus kalamatan Robinson and Kloss

2 ♂, 2 ♀, 30 August, 1937.

Mayr reduces *kalamatan* to a synonym of *ochromalus* on the grounds that the overlap in wing measurements is more than 50%. I am not willing to accept this disposal offhand. Robinson and Kloss type series came from the Saribas district of Sarawak (altitude not given), the males have a wing of 82–89, the females one of 81–84; in 1930 Chasen and Kloss gave the wing measurements of 10 ♂ from the north Bornean lowlands running from 77–85, and of 5 ♀ from 75–79, remarking that the north Bornean series was less distinct from the Malay Peninsula population than the Sarawak birds. My two Kina Balu males have wings 82.5 and 83, the females 79 and 80. A ♂ from 4000 feet on the upper Kajan River has a wing of 82.5 and three females from the same locality, 80, 83 and 84. On the other hand two males from about Sandakan have wings only 74–78 and three females 73.5–77.5, thus rather closely approximating five males of *o. ochromalus* (Malay trade skins) whose wings measure 75, 75.5, 76, 77.5, 78 and three females (Malay trade skins) 71.5, 76, 77. While the absence of any reference to the altitude of the Saribas type series and the omission of the altitude from the labels of much of the material available to me prevents positive conclusions, evidence points to *kalamatan* being a recognizable race of the mountains of Borneo, with *ochromalus* occupying the lowlands. Stresemann refers the birds collected by von Plessen on the Kajan River to *kalamatan* without comment. Unfortunately the measurements he gives are not segregated by locality.

CORVIDAE

Cissa jefferyi Sharpe

1 ♂, 1 ♀, 7000 feet, 24 and 25 July, 1937.

Chasen regards this bird as a race of *chinensis* replacing *minor* at the higher elevations. In my opinion it is more nearly allied to *thalas-*

sina of Java (which Chasen also believes to be conspecific with *chinensis*). My own feeling in the matter is that both *thalassina* and *jefferyi* should be kept as distinct species, a treatment that was accorded them by Delacour in his review of the genus (Ois., **10**, 1929, p. 2–12.)

Dendrocitta occipitalis cinerascens Sharpe

3 ♂, 3 ♀, 3100 feet, 20–24 August; 2 ♂, 1 ♀, 4800 feet, 6 and 7 June; 2 ♀, 5000 feet, 8 and 18 July; 1 ♂, 1 ♀, 7000 feet, 9 and 13 July, 1937.

So many of this series are in moult that satisfactory wing and tail measurements are not possible. The range of variation in the color of the upper parts indicate that Chasen's objection to the recognition of *D. o. tuckeri* Harrisson and Hartley, is well founded.

MUSCICAPIDAE

Muscicapula melanoleuca westermanni Sharpe

1 juv. ♂, 3100 feet, 11 August, 1937.

A juvenile, still in spotted plumage, is without doubt referable to this form; no adults accompany it.

Dendrobiastes hyperythra malayana (Ogilvie-Grant)

5 ♂, 3 ♀, 7 juvs., 5500 feet, 12 June– 3 August; 1 ♂, 11,000 feet, 12 August, 1937.

These birds, with brown (instead of blue-gray) backed females, must surely be referred to *malayana,* not to *mjöbergi.*

PYCNONOTIDAE

Chloropsis cochinchinensis flavocincta Sharpe

1 ♂, 2 ♀, 3100 feet, 21–23 August; 1 ♂, 3500 feet, 7 June, 1937.

I have doubts as to whether this bird is correctly placed as a race of *C. cochinchinensis.* Though the male of this form bears a close resemblance to the males of the *cochinchinensis* Formenkreis, the female is quite different in the possession of a black throat. Thus we have a species with a black throated male and a female with a blue-green throat found in India and Ceylon (*jerdoni*); the greater part of south-

eastern Asia (*cochinchinensis*); Malay States, Sumatra, Natuna Islands (*icterocephala*); Java (*nigricollis*) and parts of Borneo (*viridinucha*). Then suddenly we find that the female of the bird of the mountains of Borneo has a black throat; this to my mind indicates that the nearest relationships of *flavocincta* are with *media* of the Sumatran highlands in which both sexes have a black throat.

Criniger ruficrissus Sharpe

6 ♂, 6 ♀, 3100 feet, 11–24 August; 1 ♂, 5500 feet, 12 July, 1937.

Mayr has recently stated that *ruficrissus* is a distinct species, not a race of *gutturalis*. He does not say on what grounds he bases this statement; certainly there is a strong superficial resemblance between the two forms, but there can be little doubt that Mayr is right and that the much larger and relatively longer tailed *ruficrissus* deserves specific rank.

TIMALIIDAE

Rhinocichla mitrata treacheri (Sharpe)

14 ♂, 7 ♀, 3100 feet, 7–26 August; 1 ♂, 1 ♀, 1 juv. ♀, 1 not sexed, 4750 feet, 6 and 7 June; 10 ♂, 5 ♀, 5500 feet, 9 June–1 August; 1 ♂, 7000 feet, 18 July, 1937.

Harrisson and Hartley have named (Bull. Brit. Orn. Cl., **54**, 1934, p. 154) *R. m. damnata* from Mt. Dulit; not all the characters enumerated in the original description hold good, but the absence of pale shaft lines to the breast and throat feathers of *damnata* (4 examined) and their presence in every skin of *treacheri* from Kina Balu (46 examined) serve to distinguish the two races at a glance. Messrs. Harrisson and Hartley believe that a least one additional race may be separated, and this supposition is fully borne out by a series of seven specimens from the interior of Dutch Borneo (Kajan River and Mt. Tibang). This form may be called

Rhinocichla mitrata griswoldi subsp. nov.

Type.—M. C. Z. no. 236020, adult not sexed (= ♂ by measurement), Mt. Tibang, 4000 feet, collected 19 November, 1923, by Eric Mjöberg.

Characters, similar to *R. m. damnata* Harr. and Hartl. in lacking prominent pale shaft lines to the feathers of throat and breast, but

anterior under-parts much richer, Cinnamon Buff[1] to Clay Color instead of Cinnamon Buff to Dark Olive Buff.

Measurements:

treacheri	10 ♂	wing 99–109; 10 ♀ 96–104.5
damnata	3 ♂	96–106; 1 ♀ 103
griswoldi	5 ♂	98–109; 2 ♀ 95.5–100

Pomatorhinus montanus bornensis Cabanis

1 ♂, 3100 feet, 18 August; 1 ♂, 5500 feet, 19 June, 1937.

Wings 83 and 79.5 respectively. Not different from two specimens from the upper Kajan River.

Napothera brevicaudata crassa (Sharpe)

1 ♂, 3100 feet, 19 August; 1 ♀, 4900 feet, 3 July; 4 ♂, 7 ♀, 5500 feet, 11 June–27 July; 2 ♂, 1 ♀, 7000 feet, 6 and 28 July, 1937.

This bird is of course a geographic representative of *Napothera brevicaudata* several forms of which occur in the mountains of southeastern Asia. Another form of *Napothera, N. epilepidota exsul* (Sharpe) occurs on Kina Balu, but was not secured by Mr. Griswold. The generic name *Napothera* was originally introduced by Boie in 1832 and subsequently used as *Nopothera* and *Napothera* by S. Müller in 1835 but was a nomen nudum in each case; its first valid proposal was by G. R. Gray in 1842.

Staphidia castaniceps everetti Sharpe

6 ♂, 3 ♀, 3100 feet, 6–24 August; 1 ♂ 4400 feet, 6 June; 3 ♂, 2 ♀, 5500 feet, 29 June– 3 July, 1937.

In addition to the series of topotypes listed here, I have examined specimens of this bird from Long Navang and Mt. Penrissan, Dutch Borneo, Mt. Poi, 5000 feet, Sarawak, and Gunong Kanepai. While there is some variation in the color of the upper parts and especially in that of the top of the head, in the skins examined from the different localities, more material is required to determine how much of it is geographical and how much is due to wear, season or post mortem change. There appears to be no size difference.

[1]Ridgway, Color Standards and Color Nomenclature, 1912, pl. 29 and 40.

Pteruthius flaviscapis robinsoni Chasen and Kloss

4 ♂, 4 ♀, 5500 feet, 9 June– 12 July; 1 ♂, 7000 feet, 16 July, 1937.

There is no question but that this race if quite distinct from *P. f. aerulatus* with which it was principally compared, but it is very close to *cameranoi*, differing chiefly in slightly larger size.

Measurements:	♂ *W.*	*B.*	♀ *W.*	*B.*
aerulatus	78	15.1	77.	13.5
	76	14.2	76.5	13.7
			77.5	13.5
			76	13.7
cameranoi	69.5	12.9	71.5	12.3
robinsoni	72.5	12.7	73	12.5
	74	12.7	73.5	12.1
	76	13.4	74.5	12.5
	74	12.4	72.5	12.5
	74	11.1		

TURDIDAE

Copsychus saularis niger Wardlaw Ramsay

1 ♂, 1 ♀, 3100 feet, 29 July and 18 August, 1937.

Both these birds are certainly referable to *niger*, the underparts of the male are entirely glossy black, with a small amount of white in the under tail-coverts; both outer pairs of rectrices are entirely white and some of the inner secondaries white-edged; the female has the under tail-coverts mostly white; the two outer pairs of rectrices entirely and the next pair mostly, white; the white on the inner secondaries is greater in extent.

Brachypteryx montana erythrogyna Sharpe

8 ad. ♂, 6 ad. ♀, 2 imm., 5500 feet, 9 June–25 July; 2 ad. ♀, 2 imm., 7000 feet, 6–28 July; 1 ♂, 9790 feet, 29 July, 1937.

Both Myiophonus and Brachypteryx have been placed in the Turdidae by most recent authorities. Removing these genera from the Timeliidae to the Thrushes, even though the plumage of the juvenals is not characteristically thrush-like, is almost certainly the proper procedure. Anything that can be done to distribute the genera of the

so-called Timeliidae among the better characterized and more natural groups is a step in the right direction.

LANIIDAE

Hyloterpe hypoxantha hypoxantha Sharpe

1 ♂, 4 ♀, 3100 feet, 19–23 August; 1 ♀, 3500 feet, 27 June; 2 ♂, 3 ♀, 5500 feet, 10 June–31 July; 1 ♂, 1 ♀, 7000 feet, 16–30 July, 1937.

This series is exactly topotypical; three specimens from Mt. Tibang agree with it and are not like *H. h. sarawacensis* Chasen which is said to have the underparts more uniformly yellow.

The Tibang birds have wings 81.5, 84.5, 84.5; Kina Balu birds,—80, 82, 82.5, 83, 83.5, 84, 84, 85, 87 mm.

SYLVIIDAE

Seicercus trivirgatus kinabaluensis (Sharpe)

2 ♂, 1 ♀, 5500 feet, 16–30 June, 1937.

These birds appear to be of the normal type of coloration for the form.

Seicercus montis montis (Sharpe)

2 ♂, 25 and 27 June, 1937.

This species looks to be out of place in Seicercus, but is retained here for want of a better position.

Horeites montana oreophila (Sharpe)

1 ♀, 5500 feet, 30 June; 2 ♂, 11,000 feet, 15 August, 1937.

Chasen places the *montana* Formenkreis in Cettia, but that genus is characterized by very weak and poorly developed rictal bristles while those of Horeites are prominent. A general revision of the Sylviidae will doubtless result in a very different arrangement from that in use at present.

ZOSTEROPIDAE

Zosterops atricapilla clara Sharpe

1 ♂ juv., 3100 feet, 13 August; 1 ♂, 4750 feet, 7 June; 1 ♂, 5500 feet, 11 June, 1937.

Chasen synonymizes *clara* with typical *atricapilla* from the highlands of Sumatra; Stresemann in his review of the Zosteropidae maintains it.

Chlorocharis emiliae emiliae Sharpe

2 ♂, 1 ♀, 5500 feet, 16 June–6 July; 1 ♂, 7000 feet, 5 July; 5 ♂, 3 ♀, 9800–11,000 feet, 29 July–14 August; 2 ♂, 1 ♀, 12,000 feet, 9–11 August, 1937.

This series is topotypical of *emiliae;* in the mountains of Sarawak it is replaced by *C. e. moultoni* Chasen and Kloss.

NECTARINIIDAE

Aethopyga mystacalis temmincki (S. Müller)

2 ♂, 3100 feet, 19 and 25 August, 1937.

Not different from two males from Sumatra as far as I can see. Chasen has given his reasons for not recognizing *A. m. perretti* Harrisson and Hartley, from Mt. Dulit.

Cinnyris jugularis microleuca Oberholser

3 ♂, 1 ♀, sea level, 4–6 September; 1 ♀, 3500 feet, 7 June, 1937.

I have insufficient topotypical material of the various named forms of this species to attempt to work out their characters and distribution, but rely on Chasen's arrangement whereby the birds inhabiting the Malay Peninsula, Sumatra, Borneo and the Natuna Islands are all referred to this race, the type locality of which is Taya Island, southeastern Sumatra.

Anthreptes malacensis bornensis Riley

2 ♂, 1 ♀, sea level, 4 and 6 September; 1 ♂, 1 juv. ♀, 3100 feet, 26 August, 1937.

The identification of this small series is made largely on the grounds of probability; *bornensis* is a pretty thin form, and the fact that the males have not quite completed their post nuptial moult makes identification uncertain.

Arachnothera everetti (Sharpe)

1 ♂, 3100 feet, 14 August, 1937.

Originally described from Mt. Kina Balu, the measurements given were wing 3.6″, culm. 1.7″ roughly equivalent to 95 and 45 mm.

respectively. Griswold's bird measures wing 95.5, culm. 40; a bird from Long Navang, Dutch Borneo taken by E. Mjöberg measures wing 90, culm. 39. Four skins from the lowlands of North Borneo (Morutai Besar and Sandakan) taken by H. Deignan have wings of 88 mm. and culmens 35, 36, 36.8, 38.2. Stresemann records a male with a wing of 87 mm. from Peleben near the junction of the Kajan and the Bahau.

PLOCEIDAE

Lonchura atricapilla jagori Martens

1 ♂, 1 imm.? sea level, 4 September; 2 ♂, 3100 feet, 20 and 24 August; 1 ♀, 5500 feet, 10 July, 1937.

Bornean and Philippine examples of this species do not appear to be separable. Chasen and Kloss correctly refer to this form as *jagori*, but Mayr has recently called it *minuta*. The latter name is the older, but happens to be preoccupied.

In addition to the forms discussed in the body of this paper, Mr. Griswold collected the following species on Mt. Kina Balu, the list of which is appended for the sake of completeness.

Chalcophaps indica indica (Linné)
Centropus bengalensis javanensis (Dumont)
Cypsiurus balasiensis infumatus (P. L. Sclater)
Buceros rhinoceros borneoensis Schlegel and Müller
Rhyticeros plicatus subruficollis (Blyth)
Harpactes whiteheadi Sharpe
Harpactes oreskios dulitensis Ogilvie-Grant
Pericrocotus flammeus xanthogaster (Raffles)
Pericrocotus montanus cinereigula Sharpe
Chlamydochera jefferyi Sharpe
Hemipus picatus picatus (Sykes)
Cissa chinensis minor Cabanis
Rhipidura albicollis albicollis (Vieillot)
Rhinomyias umbratilis umbratilis (Strickland)
Rhinomyias gularis Sharpe
Culicicapa ceylonensis ceylonensis (Swainson)
Stoporala indigo cerviniventris (Sharpe)
Stoporala thalassina thalassoides (Cabanis)
Microtarsus melanoleucus Eyton
Ixos flavala connectens (Sharpe)

Trachycomus zeylonicus (Gmelin)
Pycnonotus goiavier gourdinii (Jacquinot and Pucheran)
Pycnonotus (Oreoctistes) leucops (Sharpe)
Pycnonotus (Otocompsa) flaviventris montis (Sharpe)
Garrulax palliatus schistochlamys Sharpe
Androphilus accentor Sharpe
Aethostoma pyrrhogenys canicapillum (Sharpe)
Stachyris nigriceps borneensis Sharpe
Enicurus leschenaulti borneensis Sharpe
Myiophonus borneensis P. L. Sclater
Turdus javanicus scebohmi (Sharpe)
Geokichla everetti Sharpe
Artamus leucoryn. leucoryn. (Linné)
Tesia whiteheadi (Sharpe)
Prinia flaviventris superciliaris Salvadori
Orthotomus sepium borneonensis Salvadori
Dicaeum sanguinolentum monticolum Sharpe
Dicaeum trigonostigmum dayakanum Chasen and Kloss
Dicaeum concolor borneanum Lönnberg
Arachnothera longirostra büttikoferi van Oort
Lonchura fuscans (Cassin)
Oriolus cruentus vulneratus Sharpe
Dicrurus leucophaeus stigmatops (Sharpe)
Dicrurus hottentottus borneensis (Sharpe)

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